Defense Technical Information Center

Multimedia Workshop
Presented by Infodata Systems Inc.

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Our solutions combine infodata products, off-the-shelf document management products, and custom software applications, fully-tailored to a customer's environment.

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Publishing with Multimedia

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INTRODUCTION

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I n a textbook, Fred T. Hofstetter of the University of Delaware says "the ability to use multimedia will emerge as a life skill in the twenty-first century. Citizens who do not know how to use multimedia will become disenfranchised. Cut off from the Information Superhighway, they will end up watching life go by instead of living it fully." (Multimedia Literacy, McGraw-Hill, 1997)"

Why Attend This Workshop?

To alleviate Information Anxiety about multimedia! "What is information anxiety – it is the gap between what we understand and what we think we should understand. Information anxiety is the black hole between data and knowledge. It happens when information doesn't tell us what we want or need to Know. (Richard Saul Wurman, Information Anxiety, Bantam Books, 1990)."

In today's environment, when every new week brings new software and new file formats, we all can suffer "information anxiety." It is hoped that through this workshop, you will gain insight into how multimedia can be used in your research and deliverable documents.

Research has shown that people remember nearly 90% of the information from presentations that use visuals when compared to presentations that are not visualized. And nothing makes a presentation more memorable than pictures. They inform, they clarify, they influence ... and they add impact. It is essential for writers, researchers, and trainers, to turn to new communication methods that play a key role in communicating ideas.

Definition: "Multimedia is the use of a computer to present and combine text, graphics, audio and video, with links and tools that let the user navigate, interact, create and communicate."

Multimedia can make the learning process more effective. The concept of conveying information through the combined use of words, images, numbers and sounds to capture the attention of the five senses (including touch, smell and taste) is not new. What is new are the advances in technologies which allow the reader both to receive and interact with multimedia information and sometimes even to create multimedia information.

Multimedia means, in a sense, multisensory, which is an effective way of receiving and imparting information. Each element, text, images and sounds, can reinforce each other for the purpose of conveying meaning. It helps the learner to understand ideas and information but it does demand different skills from traditional information handling.

Out of the five human senses, vision is the most powerful data acquisition for the brain. Edward Tufte, a professor of statistics and graphic design at Yale University, finds that the most effective presentation of information is visual rather than verbal alone. A visual display carries more information at higher speeds to the brain than simple speech. Plain text or speech requires more effort to follow because less information is conveyed at a slower speed thus requiring more concentration and extrapolation on the part of the listener.

A well known example of graphical communication is a map combining historical and geographic information into one graphic. This charts Napoleon's trek with his army to Moscow and their return to France. The gray section is the route to Moscow, the black is the return trip. The thickness of the line represents the number of men in the army at each point in the journey. It paints a clear picture of attrition. Along the bottom is a temperature scale that shows how cold the winter weather actually was on the grim march home.
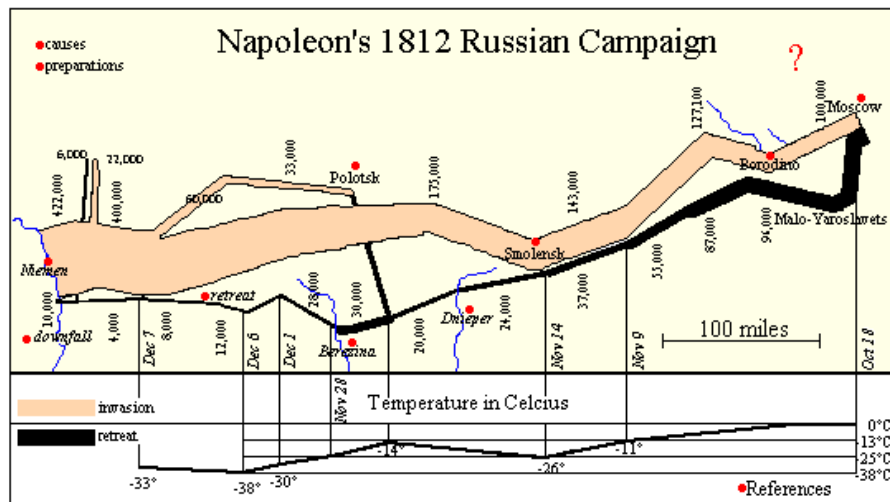
Why try to describe something to your audience when you can show it to them? For example, when someone says "Grand Canyon", you don't think of those words, you see a majestic, winding gorge.

It's All About Communication

We can trace humankind's use of pictorial symbols, or pictographs as they are often called today, to abstract prehistoric markings inscribed on rocks and the walls of caves. By 2,000 B.C., the Egyptians had created simplified images that eventually led to the replacement of symbolic pictures with phonetic writing. Over the centuries, languages evolved, adding enormous variety to the communication process.

First and foremost, a document is a tool to communicate information. The type of information will affect the type of communications. Ultimately, the content expressed in the document is what really matters. If the reader understands the content, your communication was successful.

In the fourth century B.C., Aristotle observed that a person's memory of a given item of knowledge was facilitated by associating that idea with another, either in contiguity, in sequence, or in contrast. Your document is your tool to facilitate this acquisition of knowledge on your reader's part. It is your foremost job! How else will your audience be able to recognize the value of your work?

Document Organization and Layout

There are fundamental reasons for subdividing any large body of information delivered on the printed page. Underlying all layout schemes are the limitations of the human brain in holding and remembering information. Cognitive psychologists have known for decades that most people can only hold about four to seven discrete chunks of information in short-term memory. The goal of most layout schemes is to keep the number of variables the reader must keep in short-term

memory to a minimum, using combination of graphic design and layout conventions along with division of information into discrete units.

When your content is mostly text, typography is the tool you use to "paint" patterns of organization on the page. The first thing your reader sees is not the title or other details of the page, but the overall pattern and contrast of the page. The reader's eye scans the page first as a purely graphic pattern, then begins to track and decode type and page elements.

The regular, repeating patterns established through carefully organized pages of text and graphics help the reader to quickly establish the location and organization of your information, and increase the overall legibility of your pages. Patchy, heterogeneous typography and text headers makes it difficult for the user to see major patterns quickly, and makes it almost impossible to for the user to quickly predict where information is likely to be in located in unfamiliar documents. Once the layout is defined, you can more easily determine the appropriate placement of any multimedia elements.

Too patchy, inconsistent   **Better layout of type blocks**
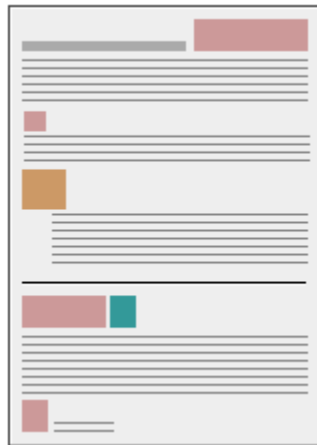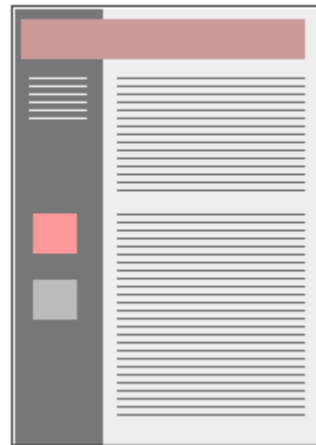
Copyright Lynch & Horton, 1997. Yale University.
http://info.med.yale.edu/caim/manual/

Steps to Good Design

Most of our current concepts about structuring information stem from the organization of printed books and periodicals, and the library indexing and catalog systems that developed around printed information. Gutenberg's bible of 1456 is often cited as the first modern book, yet even after the explosive growth of publishing that followed Gutenberg it took more than 100 years for page numbering, indexes, tables of contents, and even title pages to become routine features of books. Here are a few good steps to begin with in establishing your own document design:

ESTABLISH A VISUAL HIERARCHY

Create a strong, consistent visual hierarchy, where important elements are emphasized, and content is organized logically and predictably. Graphic design is visual information management using the tools of layout, typography, and illustration to lead the reader's eye through the page. Readers see pages first as large masses of shape and color, with foreground elements contrasted against the background field. Only secondarily do they begin to pick out specific information, first from graphics if they are present, and only afterward do they start parsing the "harder" medium of text and begin to read individual words and phrases:

Thus the overall graphic balance and organization of the page is crucial to drawing the reader into your content. A dull page of solid text will repel the eye as a mass of undifferentiated gray, but a page dominated by poorly designed or overly bold graphics or type will also repel sophisticated users looking for substantive content. What you want is an appropriate balance that attracts the eye with visual contrast.

DIRECT THE READER'S EYE

In the West readers of English read from left to right, and from the top of the page to the bottom. This fundamental visual axis dominates most design decisions, and is the basis for most conventional graphic design of print publications. In page layout the top of the page is always the most dominant location.

BE CONSISTENT

Establish a layout grid and a style for handling your text and graphics, then stick with it to build a consistent rhythm and unity across all the pages. Repetition is not boring; it gives your document a consistent graphic identity. A consistent approach to layout and navigation allows readers to quickly adapt to your design, and to confidently predict the location of information across the pages of your document.

Multimedia Goals and Design Issues

The first step in designing a document with multimedia is to make sure you have defined a set of goals - know what it is you want to accomplish. Without a clear statement of purpose and objectives, the project will begin to wander off course and bog down, or may go on past the point of diminishing returns.

Careful planning and a clear sense of purpose are the keys to success in incorporating multimedia, particularly if you will be working as part of a team. Before beginning, you should:

• Identify your target audience - Identify the potential users of your document, so that you can structure the document to meet their needs and expectations. The knowledge, background, interests, and needs of users will vary from novices who need a careful structured introduction, to experts who may chafe at anything that seems to patronize them or delay their access to information.

• Have a statement of purpose and know your main objectives - A clear, short statement of objectives should form the foundation of your document design. This is where you expand on the goals in your statement of purpose, and will be the tool you will use to analyze the success of your document. All presentations of information are determined by your objectives, the practicality of the medium you chose, and the nature of your audience.

You should also begin to identify all of the content information and graphic resources you will need to collect or create to achieve the goals you have set for your document.

Whether you're designing a handout, a slide, or a Web page, the same general graphic design principles apply. The goal with all design is to reduce the amount of effort the reader has to invest to decode the message, so that the reader can devote most of their processing power to understanding the message itself.

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A BIT ABOUT GRAPHICS

Graphics can be added to a document for a variety of purposes: to add visual appeal, demonstrate a process, represent a product, break up long passages of text thus providing relief to tired eyes, to represent an idea that is easier to show than to explain, "A picture is worth a thousand words."

In this chapter we will look at some common image types and ways of obtaining them.

IMAGES

Bitmaps and Objects

There are two broad categories for representing graphic images — bitmap (raster) and object-based (vector).

A **bitmapped** or **raster** representation is the classic form used by "paint" systems. Each dot on the display screen corresponds to a bit of information in computer memory (hence the term bit, mapped). In contrast, object-based **vector** systems (sometimes called geometric) are usually referred to as "draw" systems. Vector graphics use a geometric description to represent objects, such as lines, circles, and curves. These objects can be meaningfully manipulated as objects, not simply as dots on the screen. For example, to move a line, you can grab the end point and drag it to another place on the screen while the line stays intact; this is called rubber banding. The "paint" and "draw" distinctions originated with the success of MacPaint and MacDraw on the Macintosh, which use bitmap and vector representations, respectively.

Each approach has advantages and disadvantages. Using the bitmapped approach, you cannot select end points of lines or reshape curves. However, you can feather the edge of a shape into a soft blur or smoothly transition from one pastel shade to another. Painterly visuals such as soft edges and blurring are not practical when a system uses an object-based approach. Image manipulations with functions such as edge detection and contrast enhancement also require a bitmap representation.

Some graphics systems attempt to combine these two paradigms; however, the bitmap and vector paradigms are the two fundamental representations of images.

Here's is a simulation of the differences between bitmap and vector graphics. The left circle demonstrates how a bitmap image is defined by a finite set of pixels. Enlarge it, and you can really see the pixels. However, up the resolution to lose that "pixel-y look," and you run into vile file-size issues. The image on the right could be enlarged 10 times and still look just as sharp — if it were a vector graphic.

Some examples of Raster paint programs are Adobe Photoshop, Paint Shop Pro, Macromedia X-Res, Fractal Design Painter, and L-View.

Some examples of vector programs are Adobe Illustrator, Corel Draw, and Macromedia Freehand.

Choosing a Bitmap's Resolution

When setting the dpi (dots per inch) setting for a bitmap image, keep these tips in mind.

- For best results when printing, choose a value that divides evenly into the resolution of your printer. For example, for a 300-dpi printer, choose 75, 100, 150 or 300.

- For best results when viewing on screen, import at multiples of your screen resolution, for example 72 dpi or 144 dpi.

The larger the dpi, the smaller the graphic.
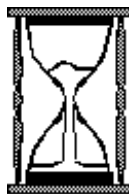
75 dpi

150 dpi

SCREEN CAPTURES AND RECORDING

Screen Capture programs let you snap a picture of a window or your entire screen and save it in different image formats. This can be helpful for a variety of reasons, to prove you made that high score in a game, show someone a problem with a program, or just to show what a program looks like.

Screen Captures in Windows 95

Windows 95 has a built-in screen capture function that can be used to copy the active window or the entire screen contents. The image is held on the clipboard until you paste it into a document or application.

- **To copy an image of the window that is currently active, press ALT+PRINT SCREEN.**

- **To copy an image of the entire screen, press PRINT SCREEN.**

TIP

To paste the image into a document, click the Edit menu in the document window, and then click Paste.

If you need to edit the screen capture, you can paste it into the Microsoft Paint program that comes with Windows 95 or other graphics editing program that you may have loaded on your system.

Microsoft Camcorder

If you installed Office from a CD-ROM, you can install and use Microsoft Camcorder to record actions, procedures, and sounds that you perform on your computer. You can save the recording as a movie that you can then play in Camcorder, or you can save the movie as a stand-alone program that you can send to others to play, even if they don't have Camcorder. For example, you can use Camcorder to create a computer tutorial that you can send to others to use. You can set preferences for movies that you record, such as the keys to use to stop recording a movie, the quality of the sound you record, and whether to show Camcorder in front of open programs.

Although you cannot run Camcorder on Microsoft Windows NT Workstation, you can play a movie that has been recorded in Camcorder as a stand-alone program.

For information about how to use Microsoft Camcorder, see Microsoft Camcorder Help.

NOTE
If you have not already installed Microsoft Camcorder, insert the Microsoft Office CD-ROM in your CD-ROM drive, and then run Microsoft Camcorder Setup. To do this, double-click the ValuPack folder on the CD-ROM, double-click the MSCam folder, and then double-click Camcordr.exe. To start Microsoft Camcorder, click the Windows Start button, point to Programs, and then click Microsoft Camcorder.

Screen Captures/Recording with the shareware program SnagIt/32[1]

SnagIt/32 by Techsmith is an excellent Capture utility that features a catalog browser for managing its image, text, and video captures. Captures are sent directly to the printer, the clipboard, or an e-mail message, saved in one of many file formats, or sent to the new catalog browser to review and process later. Includes new advanced options including a preview window, anti-alias scaling, color substitution, cropping, text editing, and automatic configuration of video parameters. Also incorporates annotation, append to file, and column delimiting features available for text captures, and DDE, batch conversion, multiple output, and autonaming features available for all captures.

A 45 day evaluation copy of **SnagIt/32** can be downloaded from it's parent site: **http://www.techsmith.com**. To cost to purchase a license is $39.95.

A product called **SnapShot** can be downloaded from: **http://www.geocities.com/CapitolHill/2171/**

SnagIt/32, SnapShot and many other Capture utilities can be downloaded from: **http://www.tucows.com**

Lotus ScreenCam

Lotus ScreenCam turns your PC into a VCR that records every click, scroll and action on your screen.

You can add captions and the sound of your voice. Then edit your instant PC movies and share them over the Internet or by e-mail with customers, colleagues and employees. Viewers can play them back even if they don't have ScreenCam on their computers.

Use up to twenty movie segments to demonstrate new products, explain complex financials, troubleshoot software problems, train new employees, share applications expertise, create custom tutorials and more.

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1. The screen captures in this document were created using SnagIt/32.

Download a 15 day trial version from the Lotus web site **http://www.lotus.com**. Cost is around $89.95 for single user license off the shelf.

Screen Recording Software for Solaris Environments

HighSoft Xrecorder(TM) is a stand-alone program which allows you to make recordings (called "xrecordings") of your software in an X Window System environment. You can then play back your xrecording without the presence of your software application during playback. In addition, HighSoft Xrecorder allows you to annotate your xrecording with visual information such as text, graphic images, pointers, and box highlights, as well as with audio such as voice-over and music. HighSoft Xrecorder requires absolutely no changes to your application software to allow capture, annotation, and playback.

Xrecorder can be used to create: Self Running Demos, Training Tutorials, WWW-based Software Product Demonstrations, Embedded Multimedia inside Digital Books. A demo version can be downloaded from the HighSoft web site at **http://www.highsoft.com**. (Click on Dog & Pony Show at bottom of web page.) Also check out the new product **Dog & Pony Show** for Windows environments.

ANIMATED GIFS

How to make GIF animation:

From Global Presence at
http://animationcreations.com/animated/gifs_index4.htm

It's easy to make GIF animation. Just three simple steps:

1   **You will need a way to make the individual images which will become the frames of the animation. Any paint or draw program will do. You can find many shareware paint and draw programs by searching through the shareware archives; for example, you could try shareware.com (www.shareware.com).**

2   **Make the frames showing the successive instances of the animation.**

You can also animate a pre-existing image. You can find a variety of available images on the web, for example browse through the sites listed in Yahoo's Icon Section at http://www.yahoo.com/ or try the Browser at Pisa at http://sunsite.unc.edu/gio/iconbrowser/icons/mirrors.html

3   **Once you have the frames ready you will need a program that can stack them into a GIF animation. Freeware or shareware programs which will do this are available for the following platforms:**

- Windows - a program called GIF Construction Set
  http://www.mindworkshop.com/alchemy/gifcon.html

  GIF Construction Set is shareware. It costs $20.00 (US) to register, plus $5.00 shipping. Please see the Alchemy Mindworks Home Page at the above URL, for complete information.

- Macintosh - a program called GifBuilder
  http://iawww.epfl.ch/Staff/Yves.Piguet/clip2gif-home/GifBuilder.html

- Unix - a program called GIFMerge
  http://the-labs.com/gifmerge.html

If you can upload your frames to a server, then you do not need any of these programs. There is a site called the Imaging Machine at http://www.vrl.com/Imaging/index.html which will stack them into a GIF animation for you over the web. You can find more information about GIF animation from Royal Frazier's All about GIF 89a at http://members.aol.com/royalef/gifabout.htm.

- **An excellent site with comparisons of 6 different animated gif programs with additional links to utility programs is the The Mining Company at http://desktoppub.miningco.com/library/weekly/blfil**

- **A page with links to a large number of animated gif web sites can be found at http://animationcreations.com/animated/gifs_index4.htm**

- **A large variety of animated gifs can be found at The Clip Art Connection at http://www.clipartconnection.com/mainframe.php3?page=gifofday.php3&gdate=081298**

Some Common Image Types

Definitions can be found in the Glossary.

Extension	Definition
.bmp	Bitmap
.cgm	Computer Graphics Metafile
.eps	Encapsulated PostScript
.gif	Graphics Interchange Format
.png	Portable Network Graphic
.rgb	Red, Green, Blue
.tif	Tagged Image File Format
.vrm	Virtual Reality Modeling Language
.wmf	Windows Metafile Format

INTERESTING FACTOIDS

• Text on a PC is usually larger than text on a Macintosh.

• Colors generally appear darker on a PC than on a Macintosh.

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A BIT ABOUT SOUND

Audio files can be very large. Your favorite song, for example, is probably about five minutes long. For the song to have the quality comparable to a CD (16-bit, 44KHz), it would need at least 10 megabytes of space. Audio samples of less than 30 seconds, which translates to just under a megabyte, at 8-bit, mono, and 11KHz or 22KHz, are a more reasonable size to work with in your documents.

DIGITAL AUDIO

Sampling Audio

Digital audio is measured using a method called sampling. While digitizing there are three aspects to this measurement and conversion: bit depth, which is the depth at which the audio is sampled. (This is similar to the bit depth of graphics where 24 bits looks better than 8 bits.) KHz, which is the frequency of sampling. (Kilohertz is thousands per second); and channels (mono, one channel or stereo, and two channels).

Downloadable Audio

The three more common audio file formats are: *.wav* (standard PC format), *.aiff* (standard CD and Macintosh format), and *.au* (standard UNIX format). Most browsers can be configured to play all of these formats, with the addition of a helper application.

Streaming Audio

Streaming audio and video are new technologies that offer the playing of files while they are downloading. Streaming audio offered over the internet requires a reduction of bandwidth, and translates into lower quality sound.

Streaming technologies include RealAudio(www.realaudio.com), NetShow (http://www.netshow.net/), and Interactive Music Architecture (IMA). These types of technologies are improving rapidly, but they still have limitations currently, such as a lack of accepted standards means that not everyone is readily equipped to access your files, limited bandwidth means lower quality, and in some cases, limits the number of simultaneous users.

As with any kind of digital signal, the phrase, "Garbage in, garbage out," is specially true when digitizing audio. Always try to use the original source of audio, and therefore the highest quality—whether it comes from a CD, a tape, or just a microphone recording your voice.

Configure Your Audio Equipment

Begin by connecting your audio source to your computer. You can either use a built-in microphone port on your computer, or in some cases you may need an audio digitizing board. Most consumer audio devices offer an audio-out port. A headphones port will work just as well for your connection. Connect the audio source to your computer using a standard audio cable. Depending on the connections on both ends, you may need to find an adapter at your local electronics store.

Test the connection by recording a short sample. With this test, you can make sure your connection is clear; it also gives you a chance to adjust the incoming signal volume. If you're using a Macintosh, you may need to increase the incoming volume within the Sound control panel, as well as on your source audio equipment.

Start Digitizing

Select Record in your sound editing software. While digitizing, make sure the volume is at the correct level. This is indicated by the volume status bar. Most audio software packages have this kind of feature. The bar shows the volume level of the incoming sound and generally reads left to right—the higher the volume, the higher the sound. Some applications color-code these levels; and, similar to a piece of home audio equipment as long as the bar stays green, the level is in the correct range. If, however, it dips into red on the high end, you should turn down the volume of your incoming source.

After you've digitized the sample, look at file using the Waveform view, accessible from the View menu. If the Waveform appears chopped off at the top or bottom, try redigitizing at a lower volume.

Special Effects and Downsampling

After you've digitized, you will have plenty of options for affecting the sound depending upon which software program you are using to edit your sound. If the volume of the clip is too low, you should be able to Amplify it. Make sure the Waveform doesn't clip at the top or bottom, in which case, you should Undo the command and try a lower percentage. Any clipping in the Waveform translates into a lower quality sound, usually with static.

When you've got your sound just right, it's time to downsample and output. If you've digitized anything other than an 8-bit, mono, 11 KHz file, you'll need to reformat it. Keep in mind that, given the current limitations of the internet, this is your optimum format. Set your Format options and save the file. The most common format for both the PC and Unix platforms is *.wav* files, and there are shareware applications for Macintosh that allow the playback of these files.

SoundApp is a Macintosh utility that easily converts *.aiff* files into *.wav* files.

SoundApp homepage: http://www-cs-students.stanford.edu/~franke/SoundApp/

Mixing Audio

Multiple audio files can be easily mixed to create a complex background sound. Open one audio file in your sound editing program and then layer or add tracks to accommodate all the sounds you want to use. When you play them back, they will be mixed automatically. You can then adjust their combined sound by moving the tracks individually to the right or left. Once you have all of your sounds in the right places, you mix the tracks together with a Mix command.

Looping Audio

Looping an audio file can be an efficient way to add musical interest without using too much bandwidth. Audio files can be looped a couple of ways, depending on how they will be accessed.

The HTML tag <bgsound> allows incorporation of a loop with the HTML page.

If you incorporate your audio file into a ShockWave animation, you can loop the file in its entirety using Macromedia's Director's scripting language, called Lingo.

SoundEdit 16 for Macintosh. This program is the most popular of the midrange audio file creation and modification programs. It is capable of creating and modifying CD quality sound or better. Some of the effects do take quite a while to be processed, but for the most part the user interface is very easy to master. There have been several improvements made in this new version of SoundEdit 16 since the release of the first SoundEdit Pro in the early 90s, including more efficient disk usage, an improved user interface, and less crashes. SoundEdit is currently in version 2.0 and the system requirements are a 68020-PowerPC with a minimum of 6megs RAM.

Here is a SoundEdit 16 link:
http://www.tamu.edu/cis/sell/soundedit.html

Saving an Audio Clip from the Web

1   **When you play a sound file (.wav, .au, .midi), a "player" window similar to the one in the figure below opens.**

2   **To save the sound file, RIGHT MOUSE CLICK on the sound player box and select SAVE AS from the pull-down options menu.**

Right mouse click on the sound player box and select Save As from the options menu.

STOP   PLAY   PAUSE
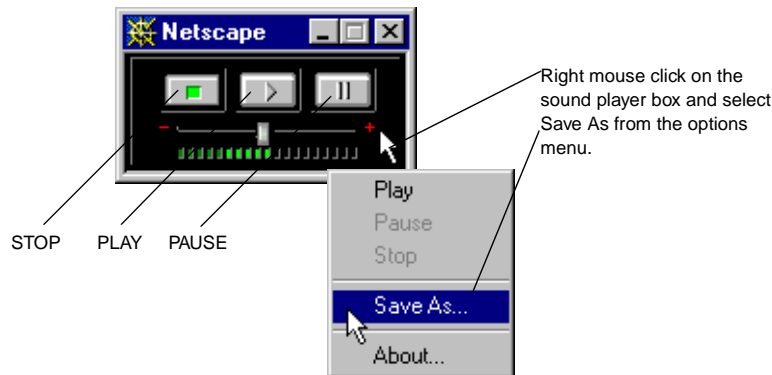
An alternate way to retrieve a file, if for instance, you are unable to save a file you listened to or had already exited the program but had not yet deleted your cache, try the following:

1   **In Windows 95, open Windows Explorer.**

2   **Navigate to the directory where the Netscape or Microsoft Internet Explorer cache files are stored.**

The default pathway to the Netscape cache file is usually something like this: C:\Program Files\Netscape\users*yourname*\cache

The default cache file for Microsoft Internet Explorer is usually found in the following directory:
C:\Windows\Tempory Internet Files

3   **Click on the TYPE button to sort files by type.**
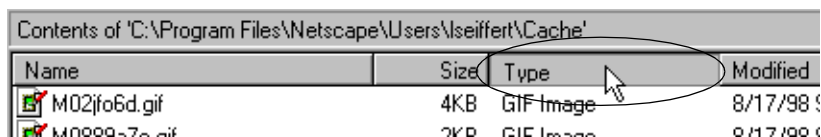
4   **Scroll down to the file type you are looking for (.midi, .wav, etc.).**

Mvs99p6k.gif	8KB	GIF Image	8/17/98 9:50 AM
Mvu0ltbj.gif	5KB	GIF Image	8/17/98 9:51 AM
M1nbjg1s.mid	4KB	MIDI Sequence	8/17/98 9:53 AM
M0ntm473.htm	1KB	Netscape Hypertext ...	8/17/98 9:50 AM
M19kmvio.htm	1KB	Netscape Hypertext ...	8/17/98 9:50 AM

Double-click on a file to hear it played. The names may not be easily recognizable (except for the extension part), so you may have to play a few to find the one you want.

If you are in the Windows 95 environment, a different player is used than the one you saw in your internet browser. It may be similar to one of the ones below:

Microsoft Midi Sequence player, plays midi music files
(comes with Windows 95)

Microsoft Sound Recorder, plays wave files
(comes with Windows 95)

PAUSE/PLAY toggle switch   STOP   Slide
Drag forward or backward to fast forward or replay.

Rewind   Fast Forward   Play   Stop

5   **Once you have found the file you want, copy or move it out of the cache file and save it in the directory of your choice (with a new name if you like, but be sure to keep the same extension or the file will no longer be recognized).**

NOTE:

All of the files in the cache folder will be deleted when you clear the cache from within your browser.

File Types

If you would like to know what file types are registered in *your* Windows 95 environment (it will differ somewhat from machine to machine depending on what

programs or add-ons have been loaded), what extensions apply and what program file will launch them, do the following:

1 **Open Windows Explorer.**

2 **Select FOLDER OPTIONS from the VIEW Menu.**

3 **Select the FILE TYPES tab.**

4 **Scroll through the list of Registered file types, highlighting the ones you want information for. (You can also highlight a file in the list and use the down and up arrow keys.)**
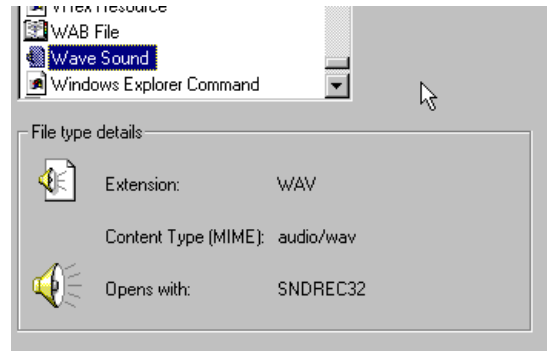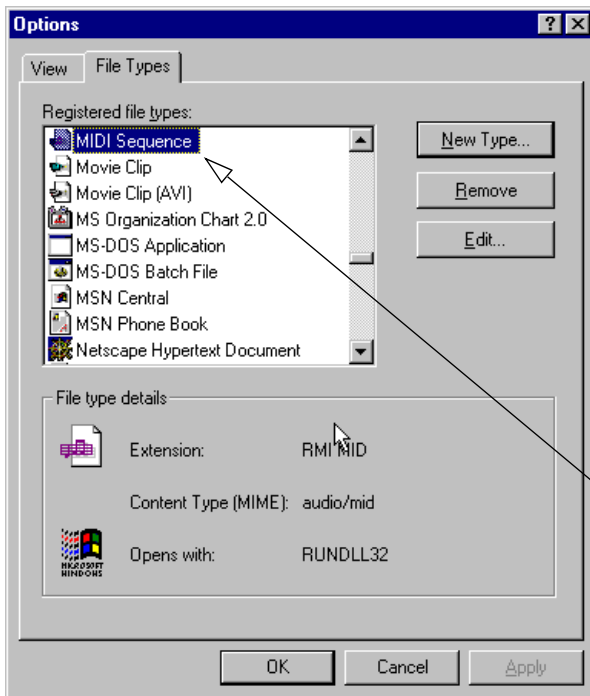
A Wave Sound has the extension .wav and opens with Microsoft's Sound Recorder (32bit) program (SNDREC32).

For this Midi Sequence file type, on this particular machine, two different extensions are possible, .RM and .MID. A file that has one of these extensions will be opened with RUNDLL32. RUNDLL32 is a Dynamic Link Library (DLL) file. A DLL file is a modular program routine that comes with or can be added to your operating system. DLL files are dynamically linked with the program that uses them during program execution. RUNDLL32 launches a Win95 program called Midi Sequence Player.

AUDIO RESOURCES

MPEG Audio

MPEG audio files are much smaller than .wav or .au files, yet retain most of the original sound quality.

MPEG, Macintosh from Kauai Media
 http://www.kauai.com/kauai/

XingSound MPEG Audio Player.
Download from: http://www.scsn.net/users/skean/mp2dl.html

MAPLAY
A simple public-domain audio player for Windows 95 and NT.
http://www.dws.org/sousa/mp2audio.htm

ActiveMovie Control that comes with Microsoft Internet Explorer had MPEG audio support built in.
http://www.microsoft.com/directx/pavilion/amovie/default.asp

For the Unix platform
maplay_tar.z
http://www.dws.org/sousa/mp2audio.htm

Midi

MIDI stands for Musical Instrument Digital Interface. MIDI is a protocol designed for recording and playing back music on digital synthesizers that is supported by many makes of personal computer sound cards. Originally intended to control one keyboard from another, it was quickly adopted for the personal computer. Rather than representing musical sound directly, it transmits information about how music is produced. The command set includes note-ons, note-offs, key velocity, pitch bend and other methods of controlling a synthesizer. The sound waves produced are those already stored in a wavetable in the receiving instrument or sound card.

Since a MIDI file only represents player information, it is far more concise than formats that record the sound directly. An advantage is very small file size. A disadvantage is the lack of specific sound control.

With a program that provides this interface, you can create music using a standard keyboard or other input device. You or others can then play your MIDI-conforming creation with the same or another program and a sound card as a music synthesizer. The MIDI program may come with a graphical user interface that looks like a

sound studio control room. Many sound cards come as a package with MIDI software (for example, Media Vision's Pro Audio Studio 16).

SELECTED LINKS

 Standard MIDI Files on the Nets is a comprehensive guide to where to find MIDI files you can play.
http://www.aitech.ac.jp/~ckelly/SMF.html

In Sweden, Dan Jannson maintains an excellent MIDI Glossary.
http://www.quicknet.se/midimusic/fmg.htm

A great link to MIDI Players, MIDI Plug-ins, & Karaoke Players can be found at:
http://www.aitech.ac.jp/~ckelly/midi/help/midi-players.html

Another site with extensive information and links for midi is the MIDI-Fest web site located at:
http://sunsite.cnlab-switch.ch/www/mirror/MIDI-Fest/

A LOOK AT VIDEO

T he old adage, "Garbage in, garbage out," holds true for digitizing video just as it does for digitizing audio. Start from the highest quality source. If you use a professional video camera or player, you'll get the best quality input. However, currently most consumer level video cameras offer Hi-8 format and S-video output. These levels of quality are better than the older 8mm and VHS standards, and are sufficient for Web video.

DIGITIZING VIDEO

Configuring Equipment

Connect your video camera or player to your video digitizing board, or directly into the computer (if your model supports video input). Almost all video digitizing boards support video cables with RCA connections. RCA cables are the standard cables used between a television set and VCR. An RCA cable transfers *composite* video, which is all the video information combined into one signal. One level of quality higher than the composite format is *S-video.* The S-video format consists of separate signals which can create a better quality video image. If your digitizing board and camera/player support S-video, use an S-video cable to make the connection and maintain better quality.

TIP

If you have a video source that supports S-video, and can't find an S-video cable, a regular Mac keyboard cable works in a pinch.

Digitizing Settings

Test your video connection by previewing your video footage. In Adobe Premiere, for example, choose Movie Capture under the File menu. This displays the Movie Capture window, which shows you a preview from your video source—digitizing starts only when you hit the Record button. Before you start digitizing, make sure the digitizing settings are properly set. When digitizing video, you want to *over-sample*, or capture more information than you're going to use to maintain the best quality.

The Preview
window in Adobe
Premiere

Choose Recording Settings in the Movie Capture menu. If your final movie will
have a pixel resolution of 160 x120, set the digitizing option to 320 x 240. Click in
the checkbox next to Report dropped frames; this helps you digitize the best
quality video. Most video sources display extra lines of video at the bottom of the
screen. This is due to a video process called *overscan,* which crops the edges and
limits the size of the video signal on your television set. In the process of digitizing
video, you may see extra pieces of video on the edges of the footage. Crop these
out later.

Now choose Video Input from the Movie Capture menu. Here, you select video
options specific to your system configuration. Choose Source from the pop-up
menu at the top. In the Source window, select your digitizer, input, and format. If
you are able to see a preview of the video in the Movie Capture window, you have
set these settings correctly. Switch to the Image window using the pop-up menu.
Adjust the hue, saturation, brightness, contrast, sharpness, black level and white
level for the incoming signal, depending on the options supported by your
hardware.

The last group of settings is specific to compression and frame rate. Choose
Compression using the pop-up menu. Select the compressor suggested by your
hardware's manufacturer, and then choose the desired frame rate of digitizing. If
your system is fast enough, you can capture a full 30 frames per second, which
also will generate a final movie file of the best quality. If, however, your system
cannot handle 30 frames per second, set the rate to 15 frames per second.

Digitize and View

Now that Premiere is configured for your session, start digitizing. Close the Video
Input window by hitting OK, and click Record in the Movie Capture window.
Digitize a couple of extra seconds at the beginning and the end of your selected

clip (you will edit these out later). Click again to stop the digitizing process. At this point, Premiere may display a window notifying you of dropped frames. If this is the case, change the desired frames per second from 15 to 10, and digitize again. After you have successfully digitized your selection, save the clip to your hard drive and play it back for content and quality.

TIP

If your video looks choppy, and it looks like you're dropping frames, make sure you have plenty of hard drive space, and optimize and defragment your hard drive.

Editing Video and Adding Transitions
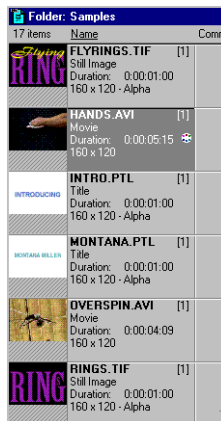
Import all of your elements.

The most creative part of working with digital video can be editing and adding transitions. After you have all of your video and audio clips digitized, and you've created all the still graphics you will need to make your movie, it is time to edit your images into the final movie.

You start by Importing all of your elements. They will be your "cast of characters," including video, stills, mattes, and audio. Keep all of your elements organized in one folder to save time.

Next, you sequence your elements. Place your video and audio clips and stills into *video and audio tracks* in a construction window, usually by taking the imported images from a project window and dragging them into the construction window. By placing all of your elements into the Construction window, you'll have a rough cut of your movie, and a general idea of the movie's length. Then you can preview the movement, and start focusing on the timing of the clips. This gives you a good idea of what needs to be adjusted or cropped.
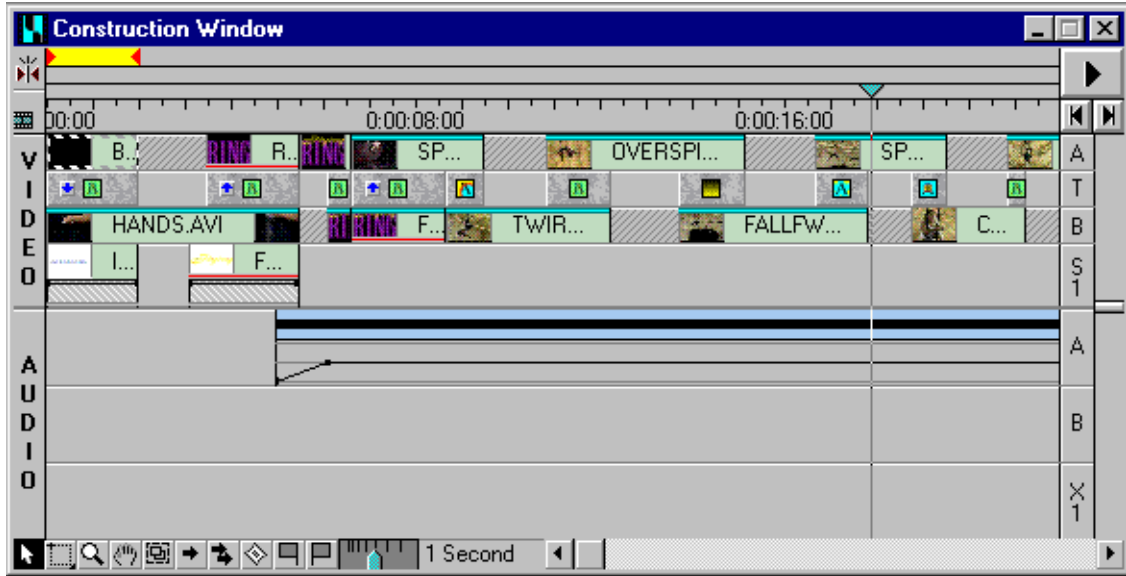
Video and Audio clips are laid out on a series of tracks, like layers, over a time continuum running from left to right. .

Output

When you have finished editing you movie, it is time to output your movie. Your output and compression options can greatly affect both image quality and file size. the key to these options is a good balance for your particular clip. For example, the best quality for some video clips may be a high frame rate. Others may require fewer frames, but a higher image quality and a larger frame size. In general, the standard 160 x 120 pixels, 15 frames per second, highest quality setting creates a good quality movie at a reasonable size. However, be prepared to try several options to finalize your output settings for the best quality.

Compression Settings

The standard, most reliable and best qulaity compressor is called Radius Cinepak. in Adobe Premiere, the Compression Settings window allows you to choose Radius Cinepak in 24-bit color, and also offers a slider bar for quality of the image.

You should do your own tests regarding different levels of image quality, and how that impacts the size of the final movie.
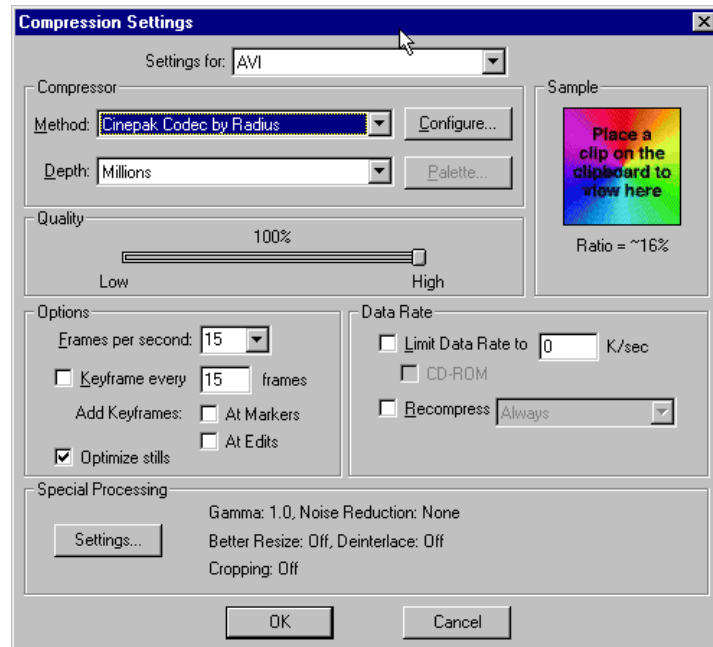
Compression Settings dialog box in Premiere.

Flatten Your Movie

When choosing the command Make Movie in Premiere on the Macintosh, you create a movie that plays on a Macintosh. To ensure cross-platform playback from the Internet, flatten your movie.

Streaming Video

Streaming video, like streaming audio is part of the new technology that offer the playing of files while they download. Offering video over the Internet requires the reduction of bandwidth by limiting pixel resolution, as well as reducing detail and color.

Streaming technologies include RealAudio, NetShow and Interactive music Architecture (IMA). Currently these types of technologies have limitations, even though they are improving rapidly. The current lack of accepted standards means

that not everyone is readily equipped to access your files, limited bandwidth means lower quality, and in some instances, limits the number of simultaneous users.

VIEWING VIDEO FILES

Windows 95 Media Player

You can use Media Player to play audio, video, or animation files, and to control the settings for multimedia hardware devices. Media Player is installed automatically with Windows 95 and requires a sound card to hear audio.
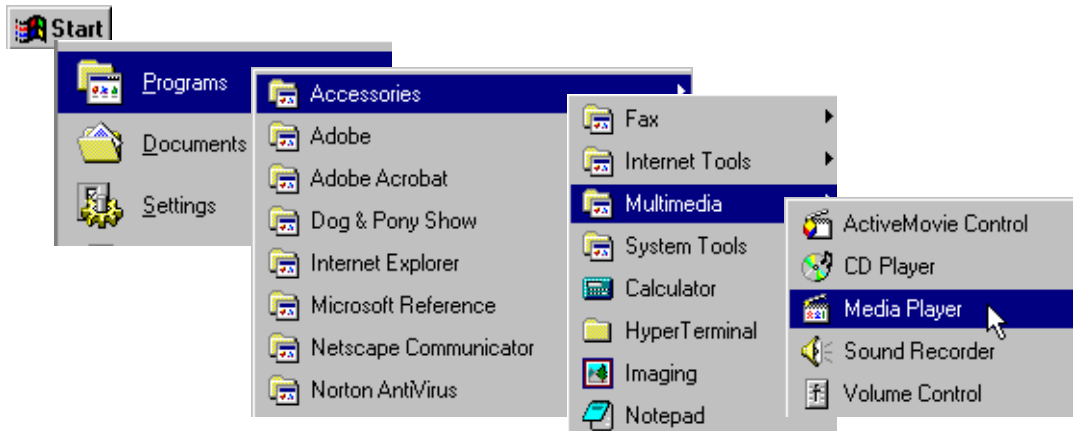
Using Media Player to view an AVI file

1   **To start Media Player, From the Windows 95 START menu, select PROGRAMS>ACCESSORIES>MULTIMEDIA>MEDIA PLAYER.**

2   **On the DEVICE menu, click the device you want.**

  • *Video for Windows* plays .avi files

  • *ActiveMovie* plays .MPEG movie files.
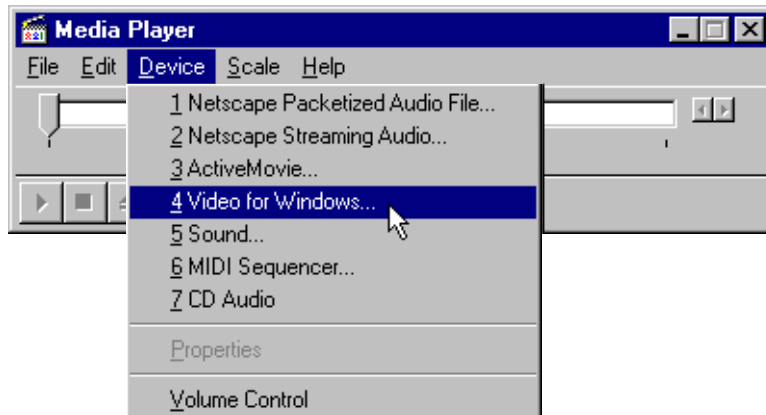
3   **Double-click the file you want to play.**
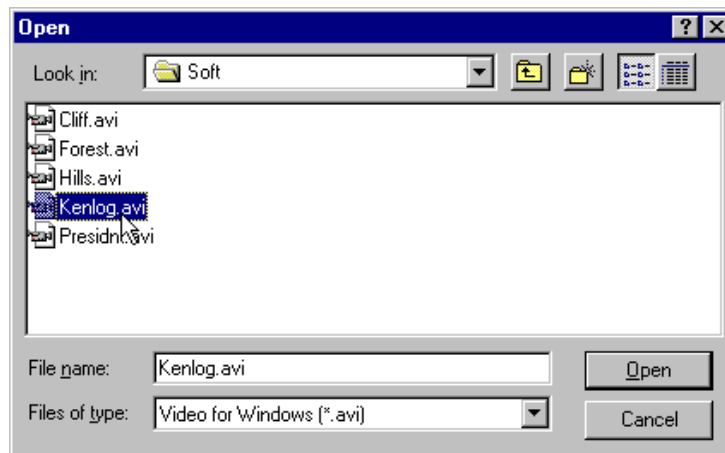
A display screen will open on your monitor. Notice that the controls on the Media Player panel have changed
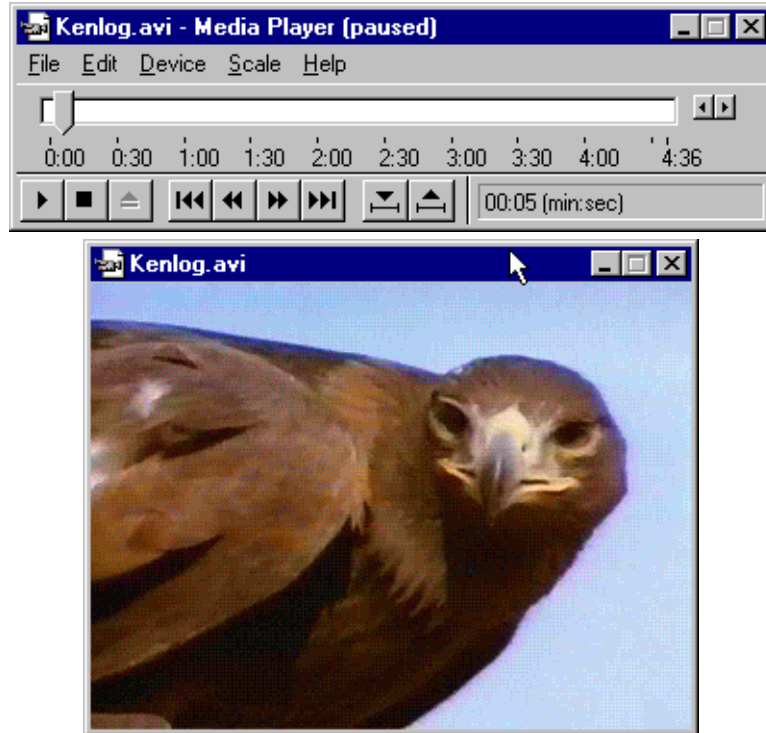
4 **Click** ▶ **to play the multimedia file.**

Click ‖ **to pause the multimedia file.**

Click ■ **to stop the multimedia file.**

TIPS
To play a portion of a multimedia file, click ⊡ at the starting point, click ⊡ to end the selection, and then click Play.
Windows includes some sample multimedia files in the Media folder.

Viewing an MPEG movie
Using the ActiveMovie program that comes with Windows 95.

1   **From you Start menu, select PROGRAMS>ACCESSORIES>MULTIMEDIA>ACTIVEMOVIE CONTROL.**

2   **From the OPEN File dialog box, select and double-click the file you would like to view.**
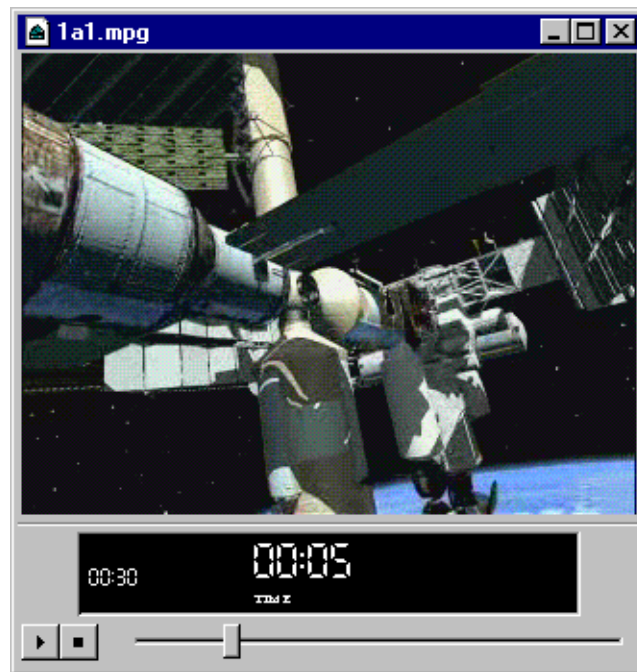
HOW TO CAPTURE SCREEN TO AVI FILES

Microsoft Camcorder

If you installed Office from a CD-ROM, you can install and use Microsoft Camcorder to record actions, procedures, and sounds that you perform on your computer. You can save the recording as a movie that you can then play in Camcorder, or you can save the movie as a stand-alone program that you can send to others to play, even if they don't have Camcorder. For example, you can use Camcorder to create a computer tutorial that you can send to others to use. You can set preferences for movies that you record, such as the keys to use to stop

recording a movie, the quality of the sound you record, and whether to show Camcorder in front of open programs.

Camcorder can save screen captures as AVI files or an .EXE file.

http://www.microsoft.com/msoffice/office97/camcorder/default.htm

Screen Captures/Recording with the shareware program SnagIt/32[1]

SnagIt/32 by Techsmith is an excellent Capture utility that features a catalog browser for managing its image, text, and video captures as AVI files. Captures are sent directly to the printer, the clipboard, or an e-mail message, saved in one of many file formats, or sent to the new catalog browser to review and process later. Includes new advanced options including a preview window, anti-alias scaling, color substitution, cropping, text editing, and automatic configuration of video parameters. Also incorporates annotation, append to file, and column delimiting features available for text captures, and DDE, batch conversion, multiple output, and autonaming features available for all captures.

A 45 day evaluation copy of **SnagIt/32** can be downloaded from it's parent site: **http://www.techsmith.com**. The cost to purchase a license is $39.95.

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1. The screen captures in this document were created using SnagIt/32.

Below are some of the options from the Input menu of SnagIt/32.
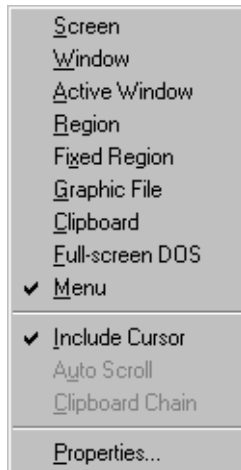
Screen shot (using SnagIt/32) from an AVI movie, saved as a bitmap file.
The size of the AVI format movie file was 63,412Kb. Size of bitmap screenshot was 109Kb.

Screen shot (using SnagIt/32), saved as bitmap image, of the same movie in MPEG format. The size of the MPEG format movie file was 63,341Kb. Size of bitmap screenshot was 125Kb.

Video Capture Cards

On Intel based PC's, use a video capture card to convert analog video from video tapes or video cameras to AVI files. A PC video capture card is typically either a 16 bit ISA bus card or a 32-bit PCI bus card that plugs into the 16 bit ISA or 32-bit PCI slots in your PC motherboard. 32-bit PCI bus cards are steadily replacing 16-bit ISA bus cards. Most video capture cards have either a composite video connector or both a composite video and an S-Video connector. Most video capture cards perform compression of the video in hardware or firmware on the video capture card before transferring the compressed video over the ISA or PCI bus to the PC hard drive.

Most video capture cards only capture video. They do not contain audio capture. Audio capture is done through the audio or sound card of the computer. It is increasingly common to have the audio input and output hardware built into the motherboard. The computer may not have a physically distinct sound card.

Sound cards usually have a Microphone input jack, a Speaker or Headphone output jack, a Line input jack, and a Line output jack. Line input and the microphone input are not interchangeable. The jacks use different electrical signals. Most users will use the microphone for input and speakers or headphone for output.

Authoring Tools to Create AVI Files

A wide variety of 2D and 3D animation applications as well as other multimedia authoring tools generate AVI files directly. This is especially true for Windows versions of applications, since Microsoft provides an API for creating AVI files. A list of applications that can create AVI files follows.

ADOBE PREMIERE

The Adobe Premiere™ program brings the world of digital moviemaking to the desktop. Adobe Premiere works with Microsoft® Video and QuickTime® for Windows software, and it lets you record, create, and play movies with video, sound, animations, photographs, drawings, text, and other material by using your PC or Macintosh. *See Appendix D for GSA pricing on this product.*

Microsoft Video and QuickTime for Windows are system utilities that let you integrate audio and video in Windows applications. You can play Adobe Premiere movies in any application that supports the Microsoft Video or QuickTime for Windows format, or you cab output movies to videotape.

http://www.adobe.com

LIGHTWAVE 3D 5.5 FOR WINDOWS 95 AND WINDOWS NT

LightWave is a popular 3D modeling and animation program widely used in broadcast television. LightWave can do almost anything and supports third party plug-ins to add features that it lacks.

http://www.lightwave3d.com/

NEWTEK

http://www.newtek.com/

CALIGARI TRUESPACE 1,2, AND 3 FOR WINDOWS

Caligari TrueSpace is a popular low-end 3D modeling and animation program. Traditionally, TrueSpace has been polygon based limiting its usefulness for modeling organic forms. TrueSpace 3.0 adds some organic features.

http://www.caligari.com/

FRACTAL DESIGN RAY DREAM STUDIO FOR WINDOWS

Ray Dream Studio is a suite of 3D modeling, animation, and rendering tools.

http://www.fractal.com/

MACROMEDIA DIRECTOR 6.0 FOR WINDOWS

Macromedia Director is a widely used authoring tool for creating interactive 2D animations such as presentations, multimedia for kiosks, prototypes of user interfaces, and similar uses. Director can also produce straight 2D animations appropriate for AVI files.

http://www.macromedia.com/

CORELMOVE

Corel's CorelMOVE animation software can export AVI files.

http://www.corel.com

MPEG Video

MPEG is a powerful lossy compression algorithm. Realtime playback requires a powerful processor or a dedicated hardware add-on. The MPEG standard specifies three increasingly sophisticated compression methods. Many MPEG players support only level 1. Also, many players support only video playback, and not playback of any accompanying MPEG audio track.

SPARKLE

Sparkle for Macintosh by Maynard Handley <maynard@elwing.otago.ac.nz>, plays MPEG and QuickTime movies and can convert movies from one format to the other. Freeware.

ftp://ftp.its.queensu.ca/pub/macintosh/Internet_Helpers/Sparkle245_folder.sit.hqx

Another great site for downloading Macintosh software can be found at:
http://ccsmacinfo.ccs.queensu.ca/MacSDistribution/Mac_soft.html

POWERPC MPEG PLAYER

Extremely fast, but requires a PowerPC.

ftp://uiarchive.cso.uiuc.edu//pub/systems/mac/info-mac/gst/mov/mpeg-players-ppc.hqx

XANIM
For Unix.

http://www.portal.com/~podlipec/home.html

MPEG PLAYER
Macintosh or Windows. By the MPEG Software Simulation Group.

http://www.mpeg.org/MSSG/

MPEGWIN AND MPEG FOR WIN32
For Windows.

ftp://mirror.aol.com/mir01/CICA/pub/pc/win3/desktop/mpegwin.zip

ftp://mirror.aol.com/mir01/CICA/pub/pc/win3/desktop/mpegw32g.zip

XING MPEG
For Windows.

ftp://mirror.aol.com/mir01/CICA/pub/pc/win3/desktop/mpegv11d.zip

QUICKTIME VIDEO
Apple's QuickTime video technology is popular on multiple platforms. The speed of playback of QuickTime movies depends on both the speed of your processor and the compression method used in each individual movie.

http://www.apple.com

MOVIE PLAYER
Apple's standard movie player. Now allows you to flatten movies for playback on machines other than the Macintosh.

http://www.apple.com

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BRINGING MULTIMEDIA INTO MS WORD 97

5

Word comes with its own set of pictures in the Clip Gallery. You can also insert pictures and scanned photographs — called imported art or graphics — from other programs and locations.

To insert a sound file into a Word document, you can use Sound Recorder — a Microsoft Windows accessory that lets you record, edit, and play sound files.

You can also insert a video file into a Word document by using Media Player, a Microsoft Windows accessory that lets you play audio, video, or animation files.

INSERTING A PICTURE IN MS WORD 97

You can insert clip art or a picture from the Clip Gallery, or you can insert a picture or a scanned photo you import from other programs and locations.

Insert Clip Art or a Picture from the Clip Gallery

1 **Position the insertion point where you want to insert clip art or a picture.**

2 **On the INSERT menu, point to PICTURE, click CLIP ART, and then click the CLIP ART or PICTURES tab.**

3 **Click the category you want, and then double-click the image.**

Insert a Picture from Another File

1 **Position the insertion point where you want to insert the picture.**

2 **On the INSERT menu, point to PICTURE, and then click FROM FILE.**

3 **Locate the file that contains the picture you want to insert.**

4 **Click the picture you want to insert.**

5 **To place the picture in the drawing layer—so you can position it precisely on the page or in front of or behind text or other objects—select the Float over text check box.**

   To insert the picture directly in the text at the insertion point—or inline—clear the Float over text check box.

TIP

You can reduce the size of a file by linking a picture instead of inserting it. In the **Insert Picture** dialog box (**Insert** menu, **From File** submenu), click the picture, select the **Link to file** check box, and then clear the **Save with document** check box. While you can't edit the picture, you can see it in your document and print it when you print the document.

Change a Floating Picture to an Inline Picture

By default, Word inserts imported pictures as floating pictures—pictures that are inserted in the drawing layer so you can position them precisely on the page or in front of or behind text or other objects. To change a floating picture to an inline picture—one that is positioned directly in the text at the insertion point:

1 **Select the picture, and then click PICTURE on the FORMAT menu.**

   (If you don't see PICTURE on the FORMAT menu, you need to select the picture.)

2 **On the POSITION tab, clear the FLOAT OVER TEXT check box.**
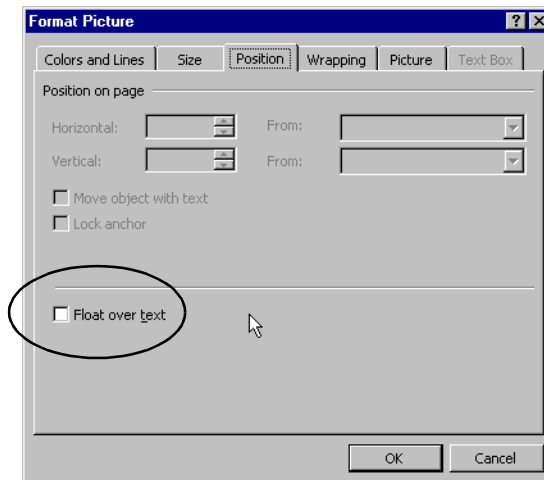
Insert a scanned picture

Your computer must be connected to a scanner to complete this procedure.

1 **Position the insertion point where you want to insert the scanned picture.**

2 **On the INSERT menu, point to PICTURE, and then click FROM SCANNER.**

3   **Scan your picture. Follow the instructions that come with the scanner you're using.**

4   **When the image appears in Microsoft Photo Editor, make any changes you want.**

For example—you can crop the picture, add special effects to it, and adjust its brightness, contrast, and color. If you need help, use Photo Editor Help.

5   **When you finish editing the picture, click EXIT AND RETURN TO on the Photo Editor FILE menu.**

N O T E
If Microsoft Photo Editor is not installed, run the Setup program again and install it.

Drag Information Between Programs

You can move or copy information, or you can create a linked object, a shortcut, or a hyperlink between documents in different programs by using drag-and-drop editing. Both programs must support OLE.

1   **Arrange the program windows so that both the source file and the destination file are open and visible. You must be able to see the information you want to drag as well as the location where you want to drop it.**

2   **Select the information, and then use the right mouse button to drag the selection to the new location in the other program.**

3   **On the shortcut menu, click the command you want.**

Crop or trim portions of a picture

1   **Select the picture you want to crop.**

2   **On the PICTURE toolbar, click Crop .**

3   **Position the cropping tool over a sizing handle and drag.**

T I P
If the **Picture** toolbar isn't displayed, right-click on the picture, and then click **Show Picture Toolbar** on the shortcut menu.

Wrap Text Around a Drawing Object

1   **In page layout view, select the text box or drawing object.**

2   **On the FORMAT menu, click AUTOSHAPE, TEXT BOX, PICTURE, or OBJECT, and then click the WRAPPING tab.**

3   **Under WRAPPING STYLE, click the option you want.**

4   **Under WRAP TO, click the sides of the text box or graphic you want text to wrap to.**

5   **Under DISTANCE FROM TEXT, specify the distance between the text box or graphic and the text that surrounds it.**

N O T E

By default, Word inserts imported pictures as floating pictures—pictures that are inserted in the drawing layer so you can position them precisely on the page or in front of or behind text or other objects. To change a floating picture to an inline picture—one that is positioned directly in the text at the insertion point—select the picture, and then click **Picture** on the **Format** menu. On the **Position** tab, clear the **Float over text** check box.

Layering Text and Graphics

You can use the **Bring in Front of Text** and **Send Behind Text** commands on the **Draw** menu to layer text and graphics.

To place the selected graphic in front of or behind text:

•   **Click the DRAW menu on the DRAWING toolbar, point to ORDER, and then click BRING IN FRONT OF TEXT or SEND BEHIND TEXT.**

Create Transparent Areas in a Picture

You can use transparent areas to integrate a picture on your page ¾ for example, when you have a picture of a person and don't want the background color to be visible.

1   **Select the picture you want to create transparent areas in.**

2   **On the PICTURE toolbar, click SET TRANSPARENT COLOR** **.**

3   **Click the color you want to make transparent.**

N O T E S

•   The **Set Transparent Color** option is available for bitmap pictures that don't already have transparency information. It's also available for some, but not all, clip art.

- You can make only one color transparent. When printed, transparent areas will be the same color as the paper they're printed on. In an electronic display—such as on a Web page or in a PowerPoint presentation—transparent areas will be the same color as the background.

- It might be difficult to see the transparent effect in a photograph because the color you select may appear in very small areas. What appears to be a single color, such as a blue sky, can actually be a range of subtle color variations.

INSERTING A SOUND FILE INTO WORD97

To insert a sound file into a Word document, you can use Sound Recorder — a Microsoft Windows accessory that lets you record, edit, and play sound files. To use Sound Recorder, you must have a sound card and speakers installed on your computer. If you want to record live sound, you also need a microphone. For more information about Sound Recorder, click the Help menu in Sound Recorder.

Insert a Sound File into a Word Document

1   **Open both the Word document and the Sound Recorder sound file you want to insert.**

To open Sound Recorder from the Windows 95 START MENU, select: PROGRAMS>ACCESSORIES>MULTIMEDIA>SOUND RECORDER.

2   **Switch to Sound Recorder, and click COPY on the EDIT menu.**

3   **Switch to Word, and click where you want to insert the sound file.**

4   **To insert the sound file as an embedded object, click PASTE on the EDIT menu.**

To insert the sound file as a linked object, click PASTE SPECIAL on the EDIT menu. Click PASTE LINK. In the As box, click WAVE SOUND OBJECT.

NOTE:
To play a sound file, double-click its icon.

Microsoft Sound Recorder

Rewind   Fast Forward   Play   Stop
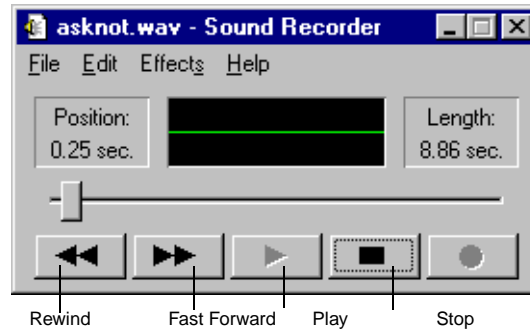
INSERTING A VIDEO FILE INTO WORD 97

You can insert a video file into a Word document by using Media Player, a Microsoft Windows accessory that lets you play audio, video, or animation files.

To use Media Player, you should have a sound card installed on your computer. For more information about Media Player, click the Help menu in Media Player.

Insert a video file into a Word document

1   **Open both the Word document and Media Player.**

   To open Media Player from the Windows 95 START MENU, select: PROGRAMS>ACCESSORIES>MULTIMEDIA>MEDIA PLAYER.

2   **Switch to Media Player, and then click VIDEO FOR WINDOWS on the DEVICE menu.**

3   **Open the video file you want to insert.**

4   **On the EDIT menu, click OPTIONS, and then specify the options you want.**

5   **On the EDIT menu, click COPY OBJECT.**

6   **Switch to Word, and click where you want to insert the video file.**

7   **To insert the video file as an embedded object, click PASTE on the Edit menu.**

NOTES

- **To insert a video file as a linked object, click OBJECT on the INSERT menu, and then click the CREATE FROM FILE tab. Select the video file you want, and then select the LINK TO FILE check box.**

- **To play a video file, double-click its icon.**

MICROSOFT CAMCORDER

If you installed Office from a CD-ROM, you can install and use Microsoft Camcorder to record actions, procedures, and sounds that you perform on your computer. You can save the recording as a movie that you can then play in Camcorder, or you can save the movie as a stand-alone program that you can send to others to play, even if they don't have Camcorder. For example, you can use Camcorder to create a computer tutorial that you can send to others to use. You can set preferences for movies that you record, such as the keys to use to stop recording a movie, the quality of the sound you record, and whether to show Camcorder in front of open programs.

Although you cannot run Camcorder on Microsoft Windows NT Workstation, you can play a movie that has been recorded in Camcorder as a stand-alone program.

For information about how to use Microsoft Camcorder, see Microsoft Camcorder Help.

NOTE

If you have not already installed Microsoft Camcorder, insert the Microsoft Office CD-ROM in your CD-ROM drive, and then run Microsoft Camcorder Setup. To do this, double-click the ValuPack folder on the CD-ROM, double-click the MSCam folder, and then double-click Camcordr.exe. To start Microsoft Camcorder, click the Windows Start button, point to Programs, and then click Microsoft Camcorder.

BRINGING MULTIMEDIA INTO POWERPOINT

6

POWERPOINT

PowerPoint is a powerful presentation package. From basic presentations to delivery on the Web, PowerPoint offers many features that can be used in research results, training development and project presentations. There are even tools available in the package to convert any presentation for delivery on the Web, either as an animated PowerPoint presentation or as HTML/GIF pages.

Using Templates

Use ready-made design templates and layouts to create text presentations. The built-in templates make it easy to generate professional-looking text slides that organize and summarize your main points.

Every time a new slide presentation is created, you must select a presentation type. Once a design is chosen, every new slide within this presentation will use this design unless you opt to override this default.

1   Select "New..." from the File menu. A "New Presentation" window should appear.

2   Click the "Presentation Designs" tab. A selection of ready-made design templates will appear.

3   Click on a design template once to view a thumbnail example of it in the right hand portion of the window.

4   When you have found a design you want, click the "OK" button and a "New Slide" window will appear.
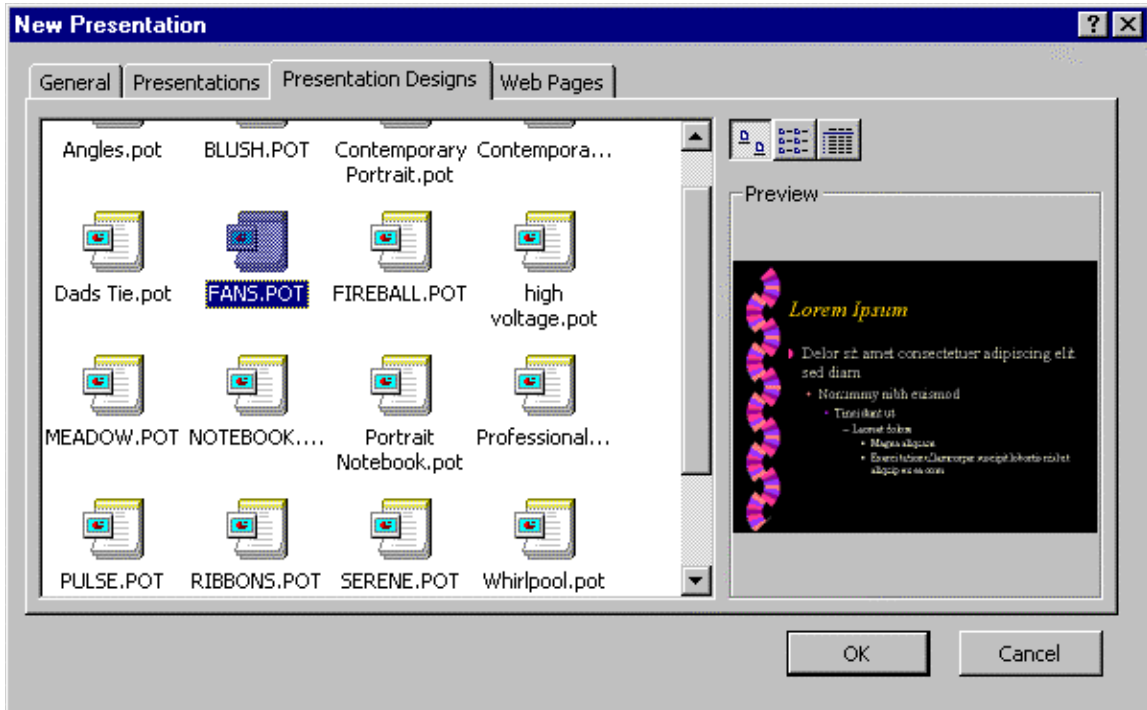
Choosing a Layout for the Slide

Every time you create a new presentation or insert a new slide, you must choose a layout. The choice of a layout, unlike the choice of a design, applies only to one slide. Different layouts afford different types of media. Some layouts contain merely text with a header. Others can combine text and clip art or other media

objects (i.e., QuickTime movies, Excel charts, Word tables). Select a layout that best fits your slide content.
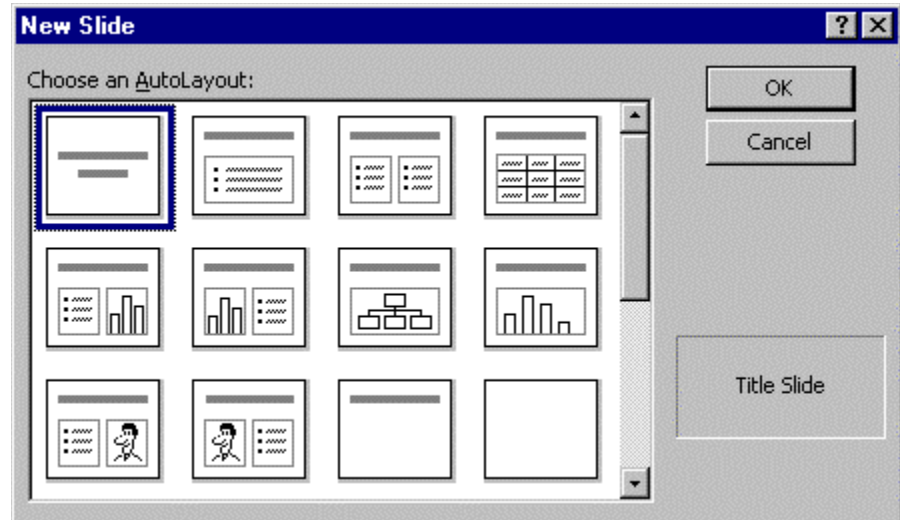
Saving Your Presentation as HTML

PowerPoint has the ability to save your presentation as a group of files which can be uploaded to the Web.

1   **With your presentation open, select "Save as HTML…" from the File menu.**
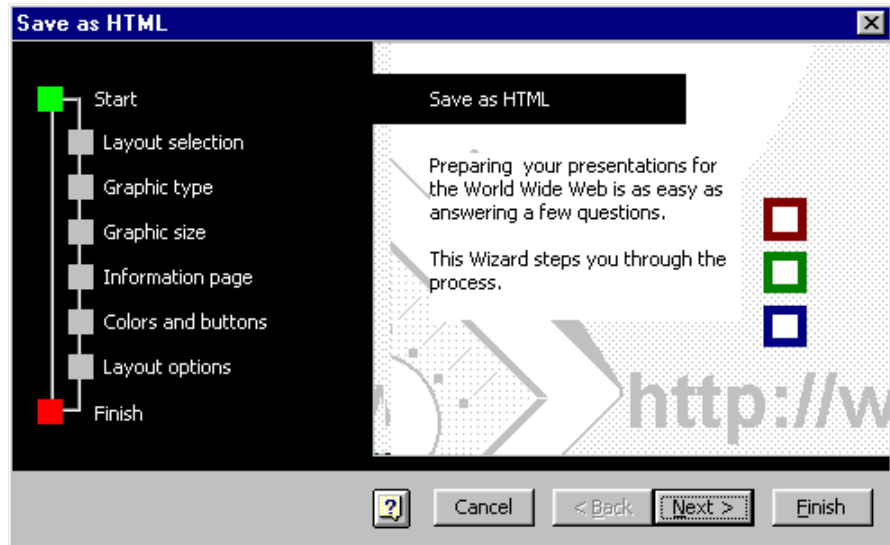
2   **A "Save as HTML" window will appear. It will act as your graphical map through the process. The "Office Assistant" may also appear offering some anemic help. Tell it to go away by selecting "No" in its dialog box.**

3   **Select the "Standard" option. It is more compatible with older Web browser versions and smaller screens. Click the "Next" button.**

4   **Follow the selections on the screen as appropriate for your presentation. If there are no inserted photographs in your presentation, use the "GIF" option.**

You may have to experiment with the different screen size settings for your particular use and audience.
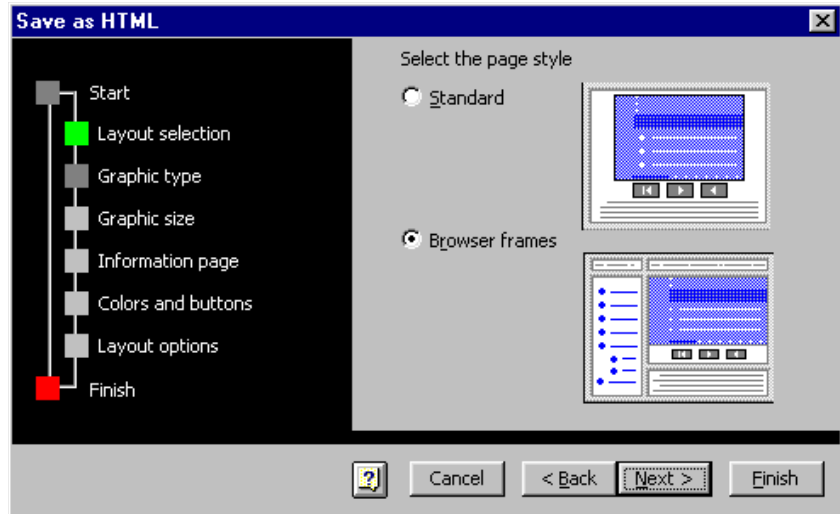
5   **Once you click "Finish", the process will export a copy of your presentation in HTML format. The result is a folder of files. These will have to be uploaded to your web site for consumption by your audience.**

6   **You should check your version in your own browser. Open the file in the directory call "index.htm" and browse your presentation!**
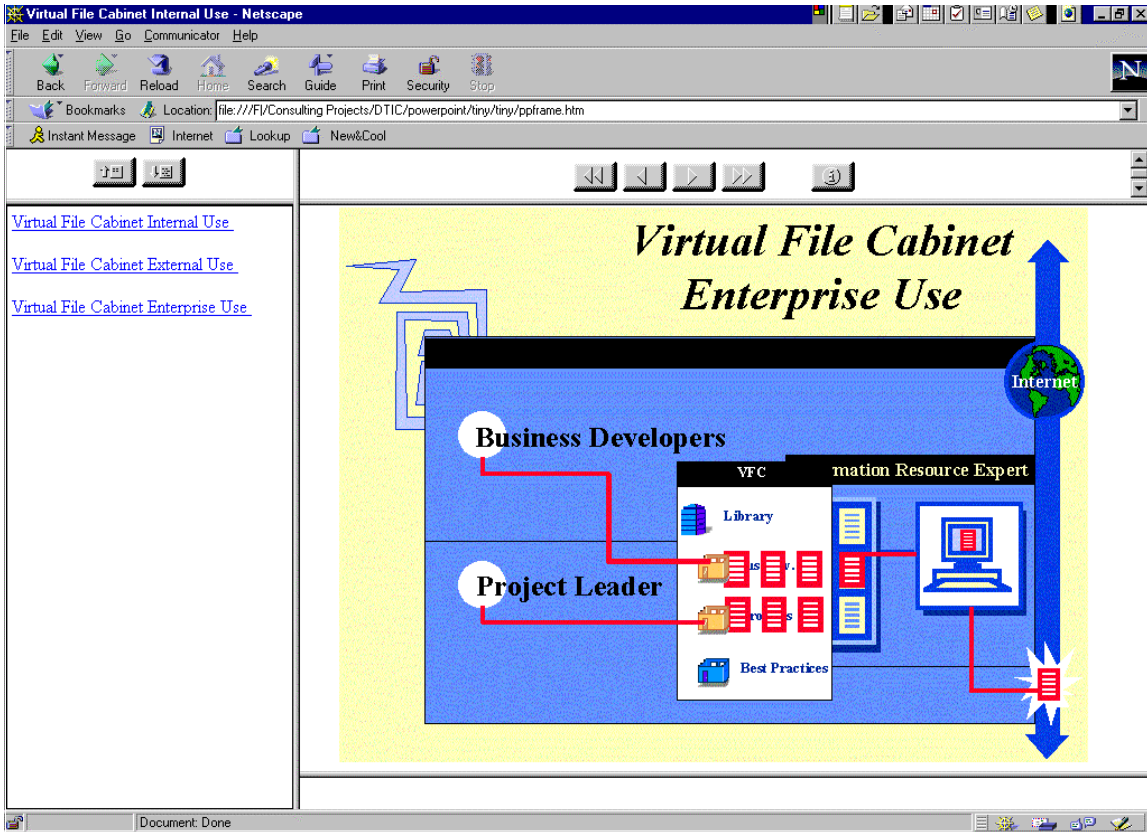
Viewing and Navigation in PowerPoint

In PowerPoint there are many different ways to create, view, and navigate your slides, depending on what you want to do to a single slide or to multiple slides.

There are six primary ways to view a PowerPoint presentation as it is being created/edited. Five of these views can be accessed from the button bar in the lower left corner of the document window. The sixth, the Slide Master view, is special and is accessed via a menu. Each of these views have certain advantages and disadvantages.

Slide View: This is the most common view for editing because objects on the slide can be easily manipulated.
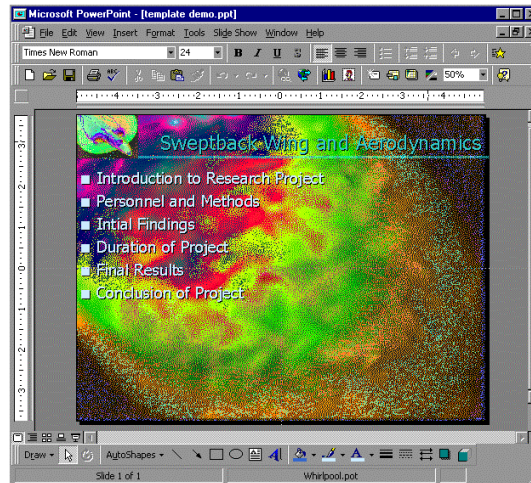
Outline View: Presentation outline can be created and edited here. Use the blue arrows in the PowerPoint button bar to indent and outdent items.
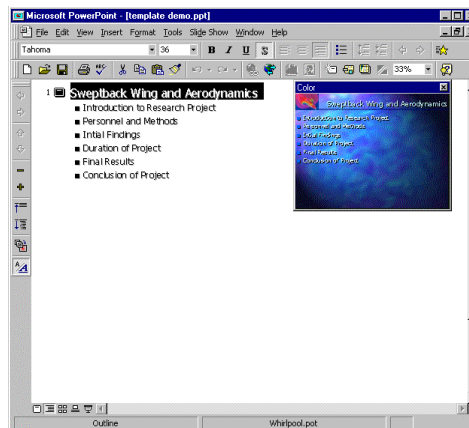
Slide Sorter View: The Slide Sorter View is analogous to a light table. This view has many helpful functions. Slides can be inserted or deleted. Slides can be rearranged by clicking and dragging (or, alternatively, cutting and pasting). The

Slide Sorter View is also a good view to apply text builds and transitions since the overall flow of the presentation can be seen with the thumbnails.
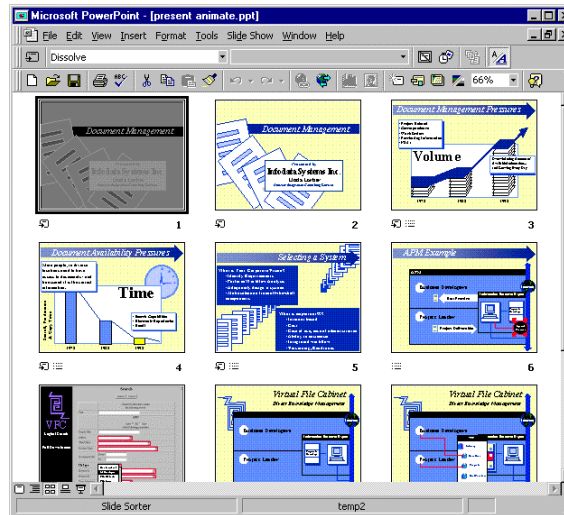
Notes View: The notes view is handy for a presenter. Text can be entered under an image of each slide for speaking notes or in-depth handouts to learners.
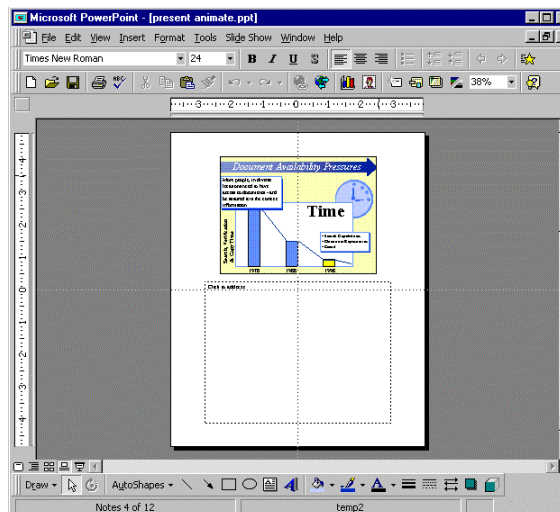
Slide Show View: This view is the full screen presentation mode for the slide show. It can be used as a dress rehearsal for transitions and text builds.

Slide Master View: This view is similar to the Slides View, but all changes made to this view are global. That is, when something is changed in this view it will change for every slide in the presentation. This is helpful for consistency of formatting elements (e.g. fonts, position of titles, departmental logo, boilerplate text, etc.). It also creates a more efficient PowerPoint file size since a global element is only saved once rather than for every slide on which the element appears. The Slide Master View is accessed through the Slide menu.

Basic PowerPoint Tips

Tired of having to click on the mouse.... try these Keyboard Shortcuts. If your selection already exhibits this behavior, these keyboard shortcuts will reset the behavior

Select all	**Ctrl+A**
Copy all selected data	**Ctrl+C**
Cut all selected data and place it on the Clipboard	**Ctrl+X**
Undo the last action	**Ctrl+Z**
Repeat last action/last typing	**Ctrl+Y**
Begin a New document/spreadsheet/presentation	**Ctrl+N**
Make new slide	**Ctrl+M**
Open an existing document/spreadsheet/presentation	**Ctrl+O**
Save	**Ctrl+S**

Close the item you are working on without Exiting	**Ctrl+W**
In PowerPoint: Quit/Exit	**Ctrl+Q**
Print	**Ctrl+P**
Make the selected item **Bold**	**Ctrl+B**
Italicize the selected item	**Ctrl+I**
Center a paragraph	**Ctrl+E**
<u>Underline</u> the selected item	**Ctrl+U**
Justify paragraph	**Ctrl+J**
Left align paragraph	**Ctrl+L**
Right align paragraph	**Ctrl+R**
Find	**Ctrl+F**
Replace	**Ctrl+R**
Nudge an item	**Ctrl+Arrow Key**
Go To Beginning	**Ctrl+Home**
Go To End	**Ctrl+End**

Adding music, sounds, and videos

PowerPoint comes with music, sounds, and videos you can play during your slide shows. Some sounds such as a typewriter or applause are available on the Animation Effects toolbar. Other sounds, as well as music and videos, are available in the Clip Gallery. To use the Clip Gallery, point to Movies and Sounds on the Insert menu, and then click either Movie from Gallery or Sound from Gallery.
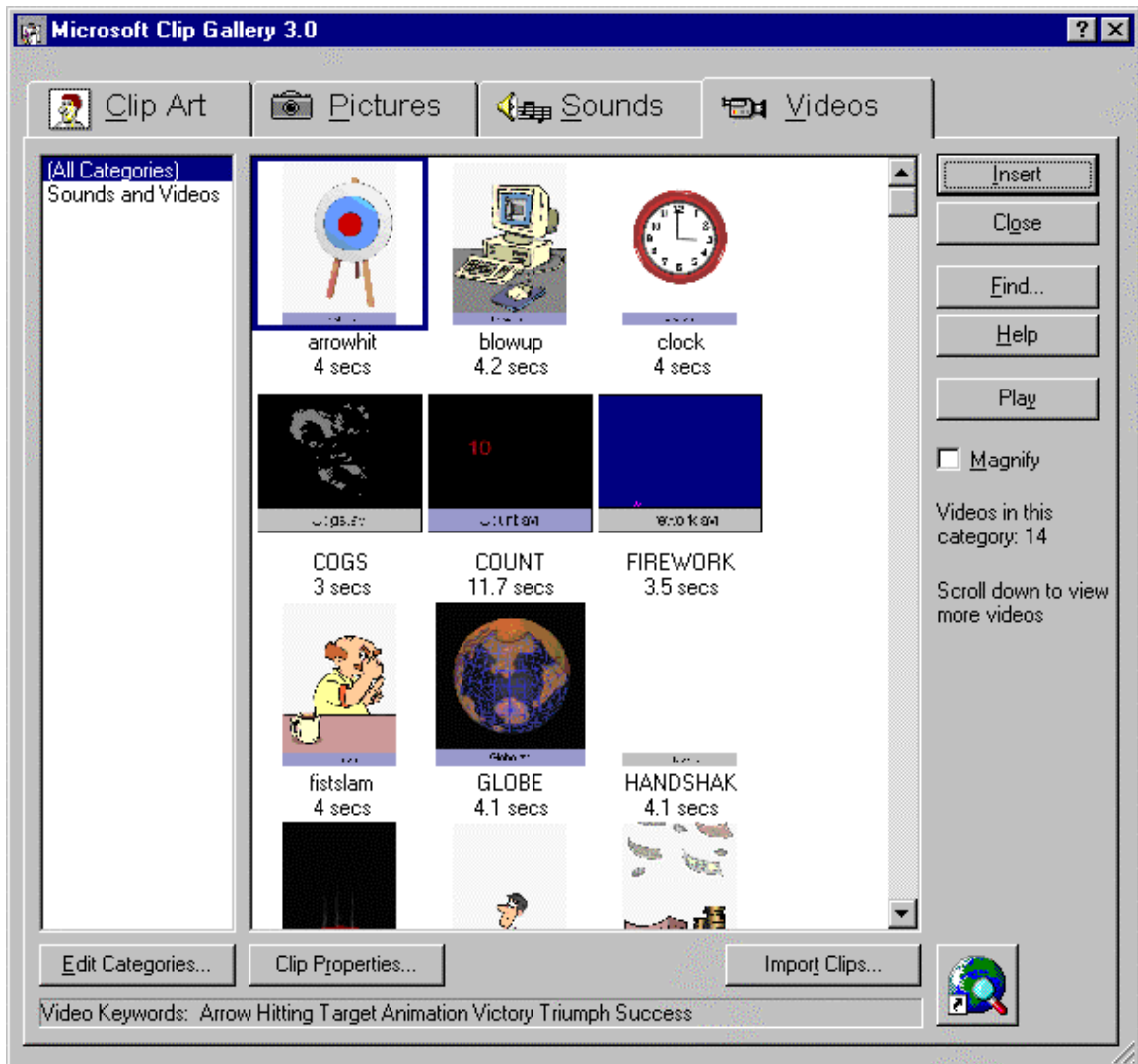
You can insert a music, sound, or video clip on a slide where you want it to play
during a slide show. By default, the sound or video starts when you click its icon
during a slide show. To change how the clip starts or to add a hyperlink to the clip,
click Action Settings on the Slide Show menu.

You can also add animation effects and change play settings by clicking Custom Animation on the Slide Show menu. For example you can set a sound or video to play automatically in an animation sequence.

Sounds, music, and videos are inserted as PowerPoint objects. To play a sound or video as a Media Player object instead, click Object on the Insert menu, and then click Media Clip. This method uses the Media Player installed with Windows 95 to run the sound or video. The Media Player plays multimedia files and controls such playback devices as compact disc and video disc players. For more information about the Media Player, use Media Player Help.

PowerPoint can support .wav and MIDI (Musical Instrument Digital Interface) files. Long wave files take up a lot of disk space. MIDI, on the other hand, defines the codes for a musical event, which includes the start of a note, its pitch, length, volume and musical attributes, such as vibrato. It also defines codes for various button, dial and pedal adjustments used on synthesizers. MIDI files (.mid) also take up much less disk space than sound files that contain the actual digitized music.

Record a voice narration or sound in a slide show

You might want to add narration to a slide show for any of the following reasons:

- For individuals who can't attend a presentation

- For self-running slide shows

- For gaining access to a slide show on the Internet

- For archiving a meeting so presenters can review it later and hear comments made during the presentation

To record a narration, your computer needs a sound card and a microphone. You can record a narration before you run a slide show, or you can record it during the presentation and include audience comments. If you don't want narration throughout the entire slide show, you can also record separate sounds or comments on selected slides or objects.

If you decide to change something in the narration you've recorded, you'll need to delete the entire narration and rerecord it. Because voice narration takes precedence over all other sounds, if you're running a slide show that includes both narration and other sounds, only the narration will be played.

Record a voice narration

1   **On the Slide Show menu, click Record Narration. A dialog box appears showing the amount of free disk space and the number of minutes you can record.**

2   **To insert the narration on your slides as an embedded object and to begin recording, click OK.**

3   **To insert the narration as a linked object, select the Link narrations in check box, and then click OK to begin recording.**

4   **Advance through the slide show and add narration as you go. At the end of the show, a message appears.**

5   **To save the timings along with the narration, click Yes. To save only the narration, click No. A sound icon appears in the lower-right corner of each slide that has narration.**

When you run the slide show, the narration will automatically play with the show. To run the slide show without narration, click Set Up Show on the Slide Show menu, and then select the Show without narrations check box.

Because you can't record and play sounds at the same time, while you're recording you won't hear other sounds you inserted in your slide show.

Record a sound or comment on a single slide

To do this procedure, you'll need a microphone.

1   **In slide view, display the slide you want to add a sound to.**

2   **On the Insert menu, point to Movies and Sounds, and then click Record Sound.**

3   **To record the sound, click Record .**

4   **When finished, click Stop .**

5   **In the Name box, type a name for the sound, and then click OK. A sound icon appears on the slide.**

6   **To animate the sound so it plays automatically in an animation sequence, select the sound icon, click Custom Animation on the Slide Show menu, and then select the options you want.**

Adding Videos

PowerPoint always needs a copy of the video file in order to play it. When using a video as part of your presentation, keep a copy of the video in the same folder as your presentation!! This will speed up the loading process, and ensure PowerPoint can always find the video if you switch computers. If the video cannot be found, the presentation will be interrupted by a "Find File" message.

To place on your slide:

1   **Go to the Insert Menu and choose Video**

2   **Choose From File, and select a .avi file**

3   **The opening frame will appear on your slide**

OR

1   **Open an AVI file in Media Player**

2   **Choose Copy in the Edit Menu**

3   **Go to a PowerPoint slide and choose Paste**

To appear on cue

1   **Place the video on the slide, as detailed above.**

2   **Select the video (click on it) and go to the tools menu and animation settings**

3   **Choose to build and then pick an effect - fly in, dissolve in, etc.**

To play when a page loads

1 **Place the video on the slide, as detailed above.**

2 **Select the video (click on it) and go to the tools menu and interactive settings**

3 **In the Play menu click on options, and play upon load is a choice there.**

About animating text and objects

You can animate text, graphics, sounds, movies, and other objects on your slides so you can focus on important points, control the flow of information, and add interest to your presentation. You can have each main bullet point appear independently of others, or you can have objects appear progressively, one after another. You can set up the way you want each bullet point or object to appear on your slide to fly in from the left, for example and whether you want other bullets or objects to dim or change color when you add a new element.

You can also change the order and timing of your animations, and you can set them to occur automatically without having to click the mouse. To set up and preview the animation of your text and objects, click Custom Animation on the Slide Show menu.

Slide show design guidelines

When you give a slide show, the content should be center stage. You want the tools you use such as animations and transitions to emphasize your points, not draw the audience's attention to special effects.

Since your audience reads from left to right, you might design your animated slides so that your points fly in from the left. Then to emphasize a particular point, try bringing it in from the right. The change will grab the audience's attention and reinforce your point.

The same principle works with sound. An occasional burst of music or sound during a transition or animation will focus the audience on the slide show. However, frequent use of sound effects can draw attention away from your main points.

The pace of your presentation also affects audience response -- going too fast exhausts audience members, and going too slow puts them to sleep. You can use PowerPoint features to rehearse your pace before you give a presentation.

While you rehearse, you can also check your slides' visual impact. Too many words or pictures can distract the audience. If you find yourself using too much text, try turning one slide into two or three, and then increase the font size.

Adding Transitions to Slides

You can alert your audience to changes in slides and changes in text as it appears on the screen by using transitions and builds.

1   **Switch to the Slide Sorter View so that you can see all or most of your presentation.**

2   **Click once on the slide to which you wish to apply the transition.**

3   **There is a menu above the slides. Select the transition you desire. Once you select a transition, the slide will mimic the effect.**
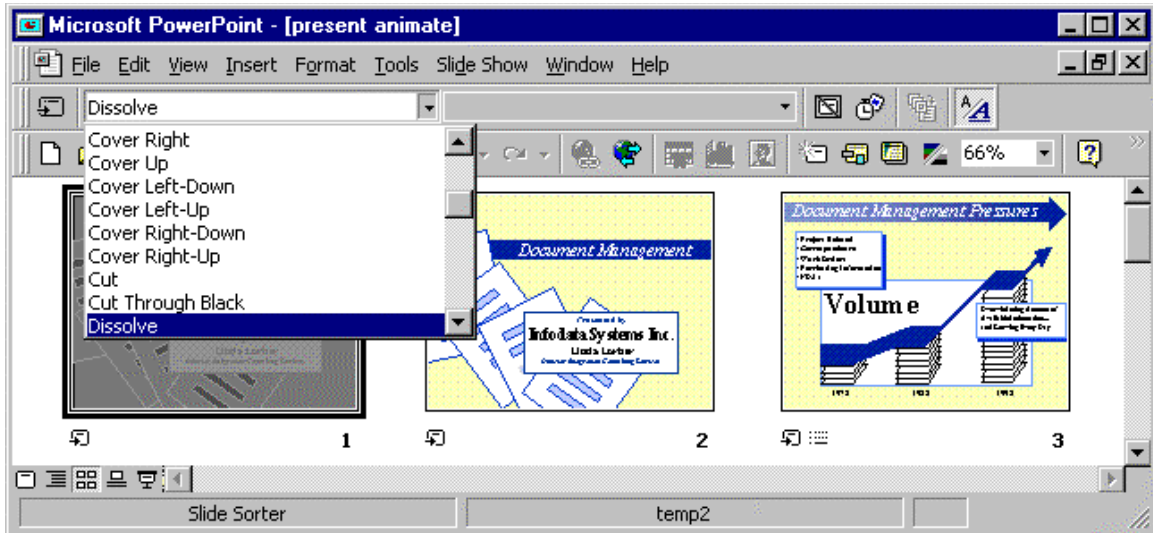
4 **More details can be controlled by clicking the button to the left of the pull down area. Click on the transition icon under the slide to see the transition.**
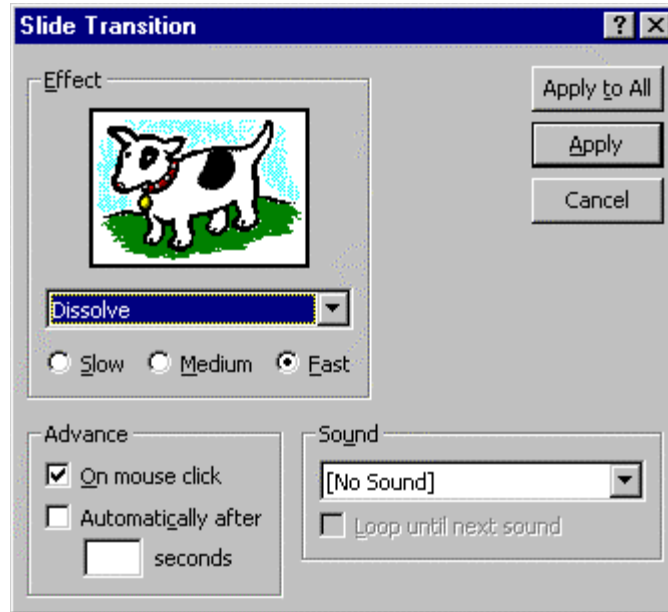
Create animated slides

You can use the Custom Animation command on the Slide Show menu to set all the animation effects you want for a slide. For example, you can set text to appear by the letter, a word, or a paragraph. You can have graphic images and other objects such as charts and movies appear progressively, and you can even animate the elements of a chart. You can also change the order in which objects appear on a slide, and you can set timings for each object.
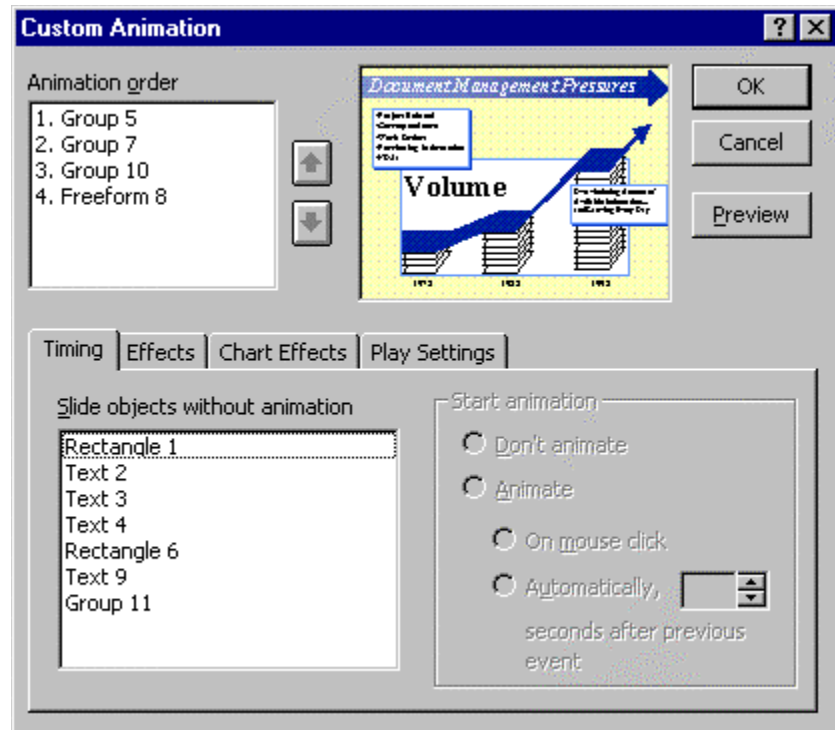
Animate text and objects

1   In slide view, display the slide that has the text or objects you want to animate.

2   On the Slide Show menu, click Custom Animation, and then click the Timing tab.

3   Under Slide objects without animation, select the text or object you want to animate, and then click Animate.

4   To start the animation by clicking the text or object, click On mouse click.

5   To start the animation automatically, click Automatically, and then enter the number of seconds you want to elapse between the previous animation and the current one.

6   Click the Effects tab. If you are animating a chart created in Microsoft Graph, click the Chart Effects tab. For information about animating the elements of a chart, click .

7   **Under Entry animation and sound, select the options you want.**

8   **Repeat steps 3 through 6 for every object you want to animate. You can click the Preview button to see how your animations work.**

TIPS

• **A quick way to create basic animation is to select the object you want to animate (in slide view), click the Slide Show menu, point to Preset Animation, and then click the option you want.**

• **To preview animations in slide view, click Animation Preview on the Slide Show menu. The animation plays in the slide miniature that appears. To replay the animation, click the slide miniature.**

Animate the elements of a chart

You can animate the elements of a chart created with Microsoft Graph.

1   **Select the chart you want to animate.**

2   **On the Slide Show menu, click Custom Animation, and then click the Chart Effects tab.**

3   **Under Introduce chart elements, select how you want to animate the chart. Options in the list change depending on the type of chart selected.**

4   **Under Entry animation and sound, select the options you want.**

5   **Click the Timing tab.**

6   **To start the animation by clicking the chart, click On mouse click.**

7   **To start the animation automatically, click Automatically, and then enter the number of seconds you want to elapse between the previous animation and the current one. The timing you set is also the time that will elapse between each animated element of the chart.**
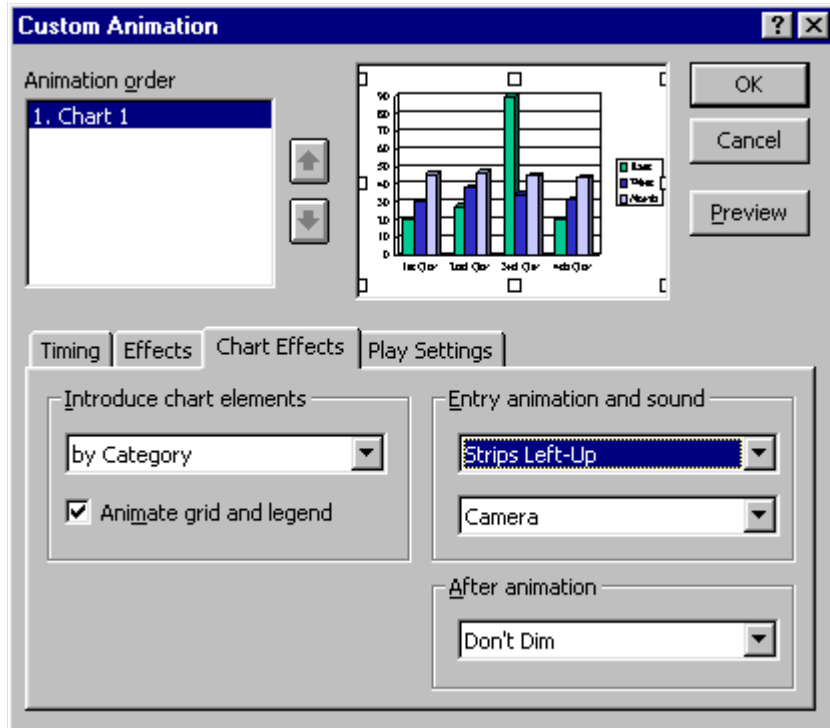
Change the order in which animated objects appear on a slide

1   In slide view, display the slide you want to change the order in.

2   On the Slide Show menu, click Custom Animation.

3   Under Animation order, select the object you want to change, and then click one of the arrows to move the object up or down in the list. Repeat the process for each object whose order you want to change.

Add an effect to an animated object after it appears

1   In slide view, display the slide you want to add an effect to.

2   On the Slide Show menu, click Custom Animation, and then click the Effects tab.

3   Under Animation order, select the object you want to add an effect to, and then click an option under After animation.

Create animated text

You can create animated text effects that move or flash for documents that will be read online. The animated effects do not print.

1   Select the text you want to animate, or click the word you want to animate.

2   On the Format menu, click Font, and then click the Animation tab.
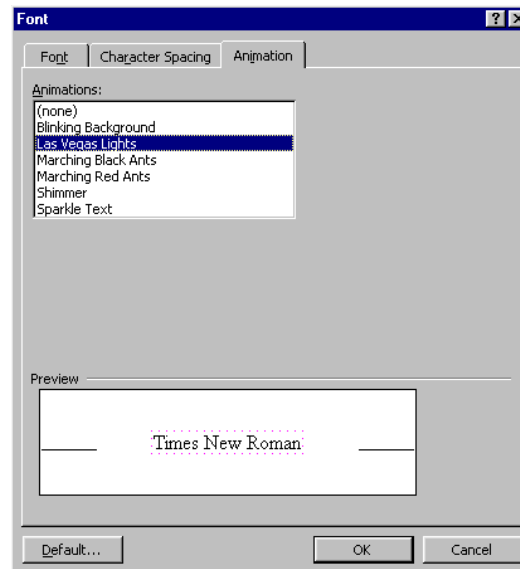
3   Click the effect you want in the Animations box. You can apply only one animation effect at a time. To remove an animated effect, select the text, and then click None in the Animations box.

Microsoft PowerPoint Animation Player for Active X

The ActiveX Animation Player for Microsoft PowerPoint is an easy way for you to publish and view PowerPoint animation and presentations in Web pages. This is a free browser extension available from Microsoft. With this extension, you can take advantage of enhanced animation, hyperlinks, special effects and built-in sound from PowerPoint to build dynamic Web pages. The Animation Publisher allows you to compress presentations prior to posting on your Web Server.

Here are a few suggestions.

•   Animate an image map for your home page with hyperlinks to other places.

- Create your home page in PowerPoint, and then add animations and sound.

- Create an animated navigation bar.

- Add small animations to liven up your existing page.

- Create ads for your Web sites that attract attention and make good use of the space.

- Put your presentation on the Internet or an intranet so others can view them in full fidelity.

- Add narration to your presentation by using RealAudio, ActiveMovie™, or a WAV file.

This is different than publishing your presentation to HTML. PowerPoint presentations converted into GIF and JPEG images is so your presentation can be viewed by any browser on any platform. However, it strips out all the animations, transitions, build effects, and multimedia effects.

If your presentations are mostly text and you want people on every platform to be able to view them, convert using the Save As HTML selection. If your audience is running Windows 95 or Windows NT and would like to see the full range of PowerPoint's special effects, use the PowerPoint Animation Player. Or you can use a combination of both and show your presentations in the fullest fidelity available on a platform.

Additional Sources for PowerPoint Information

Backgrounds for PowerPoint presentations (gif format)
http://www.colorize.com/download/bg.html

Nice, professional templates and graphics – for free!
http://www.colorize.com/do/free.html

University-based site dedicated to PowerPoint issues – very informative.
http://plato.acadiau.ca/sandbox/ppt/ppt.htm

Lots of movies available from the Popular Mechanics site (has a selection of DOD videos)
http://popularmechanics.com/popmech/movie2/1HOMEMOVIE.html

PHOTODELUXE

G raphics editing packages are the basis of all professional graphics creation. The most popular package is Adobe's Photoshop, along with Corel Draw and PaintShop Pro. The only problem for the casual user is that they are too complex to understand and require a full time commitment to achieve professional results!

PHOTODELUXE

A new entrant in this area of graphics editing is Adobe's PhotoDeluxe. It is a software package that can be considered Photoshop Light. This section is devoted to covering some of the features of this package, along with explanations on some of the graphics terminology used both this and other graphics programs.

The main difference between this package and others is that there are wizard-like cue cards that help you achieve professional results without being a graphics professional. It also gives you a chance to create high-end graphics and learn as you go.

Making Selections

Most of the PhotoDeluxe Business editing tools and special effects change the entire photo. To change only an area of a photo, you must select that area before you use the tool. For example, if you want to copy part of a photo and paste it onto a different background, you have to select the part of the photo you want before you copy it.

When working with digital photos, making a selection means drawing a special outline (called a selection border) around the part of the photo you want to change. Once an area is selected, special effects and painting and editing tools will affect only that area. Unselected areas will not be affected.

When working with digital photos, making a selection means drawing a special outline (called a selection border) around the part of the photo you want to change. Once an area is selected, special effects and painting and editing tools will affect only that area. Unselected areas will not be affected.

Layers

Most graphics packages let you work in layers. PhotoDeluxe Business lets you create pictures with multiple layers. Each layer is like a transparent sheet of plastic on which you can place a photo, add text, or paint. The layers are stacked one on top of the other, and where there are no images on a layer, you can see through to the layer below. Layers let you experiment freely with different combinations of

photos, text, and graphics without affecting the photo underneath. You can add, delete, and rearrange the stacking order of layers.

Image layers   Merged image

When you add text to a photo, it creates a special layer at the top of the layer stack (in front of all other layers). This layer is always at the top of your layer stack. Unlike other layers, you cannot select, delete, or change the stacking order of the Text layer.

Your most important tool in working with layers is the Layers palette, which shows you how many layers your picture has, what is on each layer, and provides other tools for working with layers.

You can use the Blend and Opacity options in the Layer Options dialog box to blend photos on layers and to create a variety of unique and interesting effects. The Blend options control how the photo on a layer blends with the photo below it. The Opacity option lets you make a photo semitransparent so that the photo on the layer below shows through. You can set these options when you create a new layer. You can also change these settings at any time.

Special Effects

There are a more limited number of special effects in PhotoDeluxe than there are in Photoshop, but that's still okay – there are lots and you have control over aspects such as color and special effects.
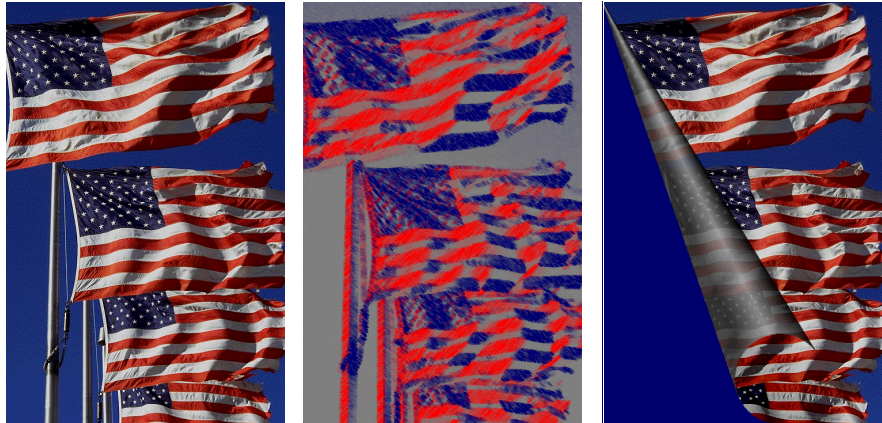
Here is a table enumerating the different special effects that can be found in PhotoDeluxe:

Accented Edges	Find Edges	Reduce Graininess
Bas Relief	Fragment	Remove Moire Pattern
Blur	Funnel	Remove Red Eye
Blur More	Glowing Edges	Ripple
Chalk & Charcoal	JPEG Clean Up	Sharpen
Chrome	Mezzotint	Sharpen Edges
Circular	Mosaic	Sharpen More
Cloud Texture	Motion Blur	Shear
Clouds	Negative	Soften
Colored Pencil	Neon Glow	Solarize
Crackle	Noise	Sphere
Crystallize	Note Paper	Sponge
Despeckle	Page Curl	Trace Contour

Diffuse	Patchwork	Twirl
Dust & Scratches	Pinch	Unsharp Mask
Emboss	Pointillize	Variations
Extensis IntelliFix	Pond Ripple	Wind
Facet	Posterize	

PhotoDeluxe, Cost: $99.00.

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ADOBE ACROBAT

Adobe Acrobat 3.0 is actually a family of applications designed to work as an integrated set of programs which allows you to view, create, modify, and enhance PDF files that were created in your favorite applications. Whether you are publishing them on your Web site, intranet, CD-ROM, or by e-mail you can quickly deliver business documents without re-authoring or learning new applications.

Readers/Viewers

These products allow you to print and view PDF files, and in the case of Acrobat Exchange, you can also enhance the files.

Acrobat Reader is an Acrobat viewer only. There are two versions of Acrobat Reader; Reader without Search and Reader with Search. Reader with Search is used when searching indexes created by Acrobat Catalog.

Acrobat Exchange is an Acrobat viewer that lets you modify PDF documents, enhancing them with hyperlinks, movies, sound, security protection, and interactive forms. You can also use Exchange for simple text editing and for correction of captured files.

Producers

These products assist you in creating PDF files. Each have distinct advantages and disadvantages that will be discussed in depth.

1   *Acrobat Distiller* **converts PostScript files to PDF documents. Use Distiller with complex page layout documents or with documents that contain Encapsulated PostScript (EPS) graphics or images that you need to compress and re-sample precisely.**

2   *PDF Writer* **is available to you after installing Acrobat Exchange. Acrobat PDF Writer is a printer driver that "prints" PDF files using the standard application Print command. Use PDF Writer for fast conversion of simple text business documents to PDF.**

3   **Designed for production conversion,** *Acrobat Capture* **turns paper documents into PDF files ready for distribution on the World Wide Web, corporate intranets, CD-ROM, or e-mail. Capture provides the tools to quickly scan and OCR documents, preserving the graphics, formatting, and layout.**

Indexer

This products allow more fluid access to the information in your PDF documents. Using Catalog to build indexes to enable full-text search makes your documents highly usable by your intended audience.

• *Acrobat Catalog* enables you to create full-text indexes of PDF document collections that are searchable using the search query tool that is part of Exchange and Reader with Search.

Creating PDF Files

The source file or original content of a PDF file is created in any word-processing, page-layout, office program, or graphical application. The source file is then converted in one of three ways to PDF:

• PDF Writer

• Distiller/Distiller Assistant

• Capture

WAYS TO CREATE A PDF FILE

PDF Writer

PDF Writer is a printer driver, but it creates PDF files instead of a print file with printer commands. Any application that allows you to print to a printer will allow you to select and print to the PDF Writer 3.0 driver. After Acrobat Exchange has

been installed on your system, you will find the additional PDF Writer printer selection available in your print menu. PDF Writer is used for quick conversion of simple documents (mostly text). PDF Writer allows you to:

• Create a PDF file from almost any application in Windows 3.1, Windows 95, and Windows NT.

• Create a PDF file from almost any application on a Macintosh.

• Choose from a list of standard orientation and page sizes or enter values for a custom page size.
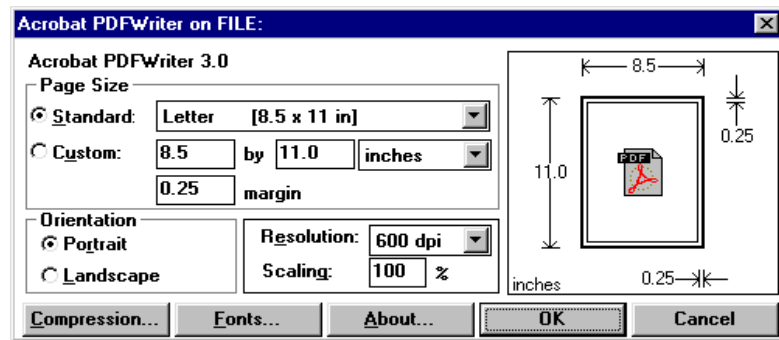
Distiller and Distiller Assistant

Distiller provides you with the ability to set up a production process for converting large numbers of documents to PDF and select specific compression and resampling methods for problem documents. You should use Distiller for documents that contain EPS graphics, bitmap images, or files that have been optimized to print to PostScript.
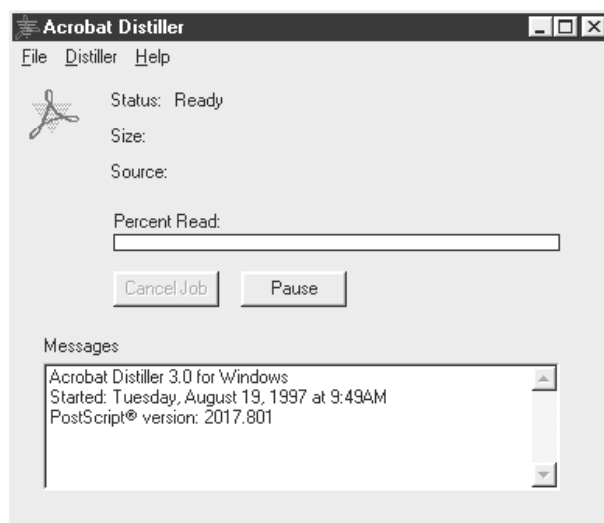
Distiller Assistant makes it possible to print directly to Acrobat Distiller so that you can create PDF files in one easy step. You can save or automatically view the new PDF file and specify the PDF file location. Distiller Assistant is also used to monitor watched folders and for Drag-n-Drop activities.

Capture and Capture Plug-In

Capture and the *Capture Plug-in* allow you create PDF documents from paper files or electronic images. When using Capture Plug-In, the scanned or imported image is converted but all objects remain bitmap pictures within the PDF file. You must use the Capture feature to further convert the bitmaps into "live" text. This text can then be edited, copied, and searched.

• The Capture software combined with a scanner is appropriate for heavy scanning and the processing large amounts of information.

• The Capture plug-in utility is used for light duty scanning and capturing.

Choosing the Correct Producer

Use Distiller/Distiller Assistant if…	Use PDF Writer if…	Use Capture Plug-In if…
Source file is from desktop publishing package	Source file was created using simple a business application	Source file is an image file
Source file contains graphics	Source file does not contain graphics	For small amount of simple paper documents
There are multiple files to batch process	Your system has limited RAM available	Already in Exchange working on document
Distiller needs to be shared over a network	Want to produce PDF files very quickly	
Results from PDF Writer are unsatisfactory		

USING OPTIMIZED FILES IN ELECTRONIC PUBLISHING

Up until the introduction of optimization and byte-serving, the debate on whether or not to use PDF as the format for electronic delivery of documentation leaned heavily toward not using it. HTML seemed the better choice because of filesize and the time it took to download large files. Users without powerful machines, storage, RAM, and fast internet connections to handle the transfer of large PDF files were inclined to request HTML versions of the required documents. Companies responded to their customers frustration by sticking with HTML.

Of course, HTML could not deliver the document design and layout that these same companies had spent many dollars and man-hours to create for the print versions. More money had to be spent after the print version was delivered to "re-author" the HTML version. Some companies decided to offer both formats, HTML and PDF, but this created another problem - version control or configuration management. With a new revision of a document, both versions had to be updated and made available. Now three copies of a document existed; the source, the PDF file, and the HTML. Storage capacity on the servers entered the picture as a new issue to deal with. The online population was becoming irritated with PDF.

Acrobat 3.0 and optimization solves all three issues; downloading time, version control, and storage capacity. Because of byte-serving, users need not wait to download the entire file. The user gets the file as it was printed in better time. Due

to better compression in Acrobat 3.0, the filesizes of PDF files are much smaller and sometimes not that much bigger than the HTML version.

What is Byte-Serving?

Today, any PDF file on any Web server can be accessed and viewed with Acrobat 3.0. However, only PDF files that have been "optimized" allow the user to progressively access and view each page as it downloads into an Acrobat 3.0-compatible Web browser.

Optimized PDF files are served from websites through a properly configured WWW server. The configuration implements a technology called byte-serving. Byte-serving is part of an Internet standard (RFC 2068 - "Byte Range Retrieval Extension to HTTP") that allows partial transfers of complex documents.

Byte-Serving Optimized Files

When a user's browser finds a PDF page on a web site, the browser launches Acrobat viewer. The first thing the server does is send the viewer the Hint Table of the objects for that page. The Acrobat viewer uses this table to request from the server the specific parts of the file needed to display a particular page. This process is invisible and almost instantaneous to the user.

This means that the Web server locates and sends only the requested page - one page-at-a-time - for the user to view, rather than the whole document.

Optimized PDF files are progressively rendered as the page downloads. Progressive rendering first displays text, then graphics, then navigational elements, then images, the fonts, and finally the thumbnails. In addition, redundant objects, such as logo graphics, are eliminated, thereby saving space in the PDF file, and time in display!

Once you have control in the Acrobat window, you can jump to any other page. The request for that page is sent to the server, and it is downloaded. As you are navigating, the file is completing its full download. The progressive rendering of the PDF file means that you spend less time viewing a blank screen, and more time absorbing what is being displayed.

Optimized PDF Documents

If you plan on publishing over the Web, you need to optimize your PDF files. The Save As command now includes an option for optimizing PDF files for online delivery. Optimization involves consolidation and reordering the information in a PDF file. This does not change the outward appearance of the file. Duplicate

background objects (text, line art, and images) are consolidated to reduce the file size significantly and objects in the PDF file format are reordered for byte serving over the Internet.
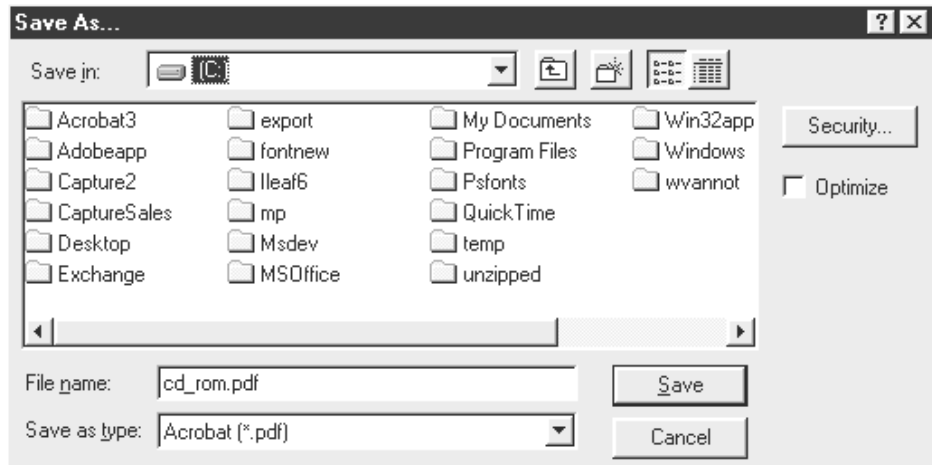
In the Acrobat Exchange Save As Dialog Box, the optimize button is at the right.

The file's optimization status is indicated in Document Info under General. File is optimized as indicated by the "Yes" in the lower left of the screen.

ENHANCING PDF FILES

We will explore the ways we can make the online representation of our print documents work for us. We will become acquainted with the navigational and interactive tools available that create dynamic and useful electronic versions of our original documents.

For instance…

I distribute a 300-page document on CD. My files were created in my publishing application of choice, PageMaker. This document is design- and layout-intensive and it contains many graphics. The document is separated into 3 files because the file size of one single file would be incredible. My customers don't read the entire document. They are looking for specific pieces of information to print out.

If you were that customer, how would you go about getting the information? If you have PageMaker installed on your system, you can open each document separately and use the Find Text feature or manually page through the documents to try and find the information you need.

Instead…

Convert the three PageMaker files to PDF. Merge them together to make one, much smaller file. Insert links in the Table of Contents to related information, references, etc.

Open the PDF document using the free Acrobat Reader (eliminating the need for PageMaker), use the find feature, and find the location of the information that I desire in one find - not three.

If I know what section the information is in, I can simply click on the link in the Table of Contents and jump there instantly. The time I used to spend trying to find the information is now spent utilizing the information.

HYPERTEXT LINKS

Hypertext is the ability to jump from one place to another within a document. Acrobat gives you the ability to create hypertext in the form of links and bookmarks.

Bookmarks

Bookmarks are hypertext links with associated icons and name labels. They can act as a navigation aid for a set of PDF files or as an electronic table of contents (TOC) for a single document. Bookmarks can be nested to represent the logical hierarchy of a TOC and can perform many actions other than jumping from one section of a document to another. They can be constantly modified, edited, deleted, and created at any time by Exchange users having permission to modify the PDF file.

Displaying Bookmarks

By clicking the Bookmarks and Page button, you will be given two windows. The document window is displayed on the right and an overview window with any bookmarks is displayed on the left.

Parts of a bookmark

Bookmarks are made up of an icon and label. Certain actions can be taken depending on whether you select the icon or the label.

1   **If the label is selected, the action of the bookmark is performed.**

   If you have been changing the text of the label, you might not be able to click on the label to execute the action of the bookmark. Click elsewhere in the overview window and then click again on the label.

2   **If the icon is selected, you can:**

• Move

• Change the properties

• Delete

• Copy. Bookmarks **cannot** be copied within the overview window or out to another document.

• Edit the label. After you have selected the icon, select the label. The text of the label is highlighted and you can change the text. You cannot change the font of bookmark name labels.
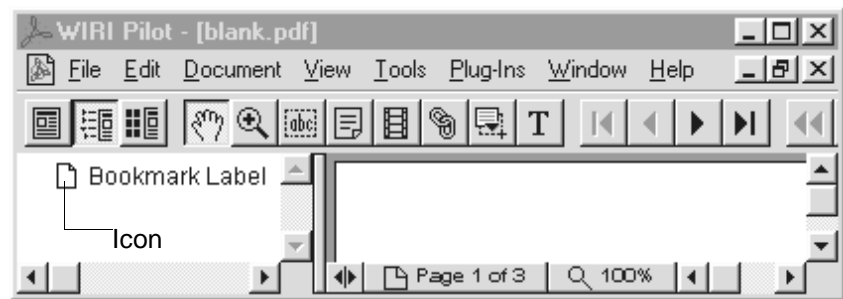
Diagram of a Bookmark

Creating Bookmarks
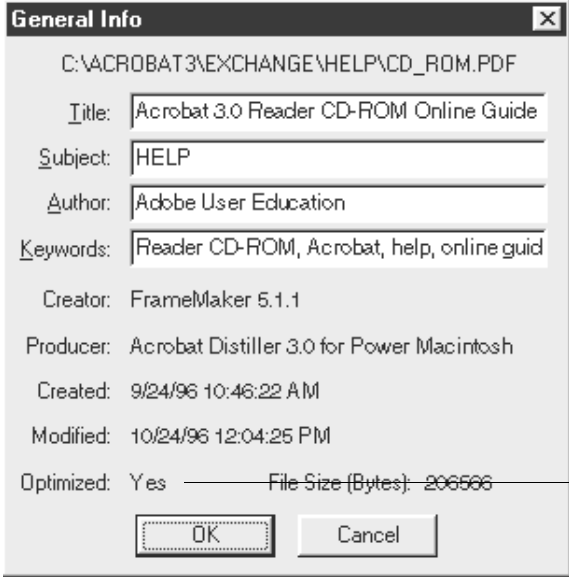
In a new session of Acrobat Exchange, the default setting for bookmark action is Go To View, the default magnification is the same as the open file magnification set in Document Information.

• During a session, the default settings for newly created bookmarks are the same as those for the last bookmark created. There are a number of ways to create a bookmark.

- Create a new bookmark and type in the text for the label.

- Copy text from the document and create a new bookmark.

- Create a new bookmark and copy and paste new text into the label.

NOTE:
The destination of a new bookmark defaults to the page currently displayed at the time the bookmark is created.

General Info	✕
C:\ACROBAT3\EXCHANGE\HELP\CD_ROM.PDF	

Title: Acrobat 3.0 Reader CD-ROM Online Guide

Subject: HELP

Author: Adobe User Education

Keywords: Reader CD-ROM, Acrobat, help, online guid

Creator: FrameMaker 5.1.1

Producer: Acrobat Distiller 3.0 for Power Macintosh

Created: 9/24/96 10:46:22 AM

Modified: 10/24/96 12:04:25 PM

Optimized: Yes ——— File Size (Bytes): 206566

OK   Cancel

This indicates that the file is optimized.
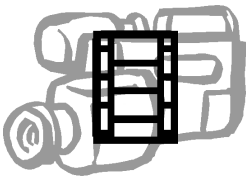
MOVIE PLUG-IN
• •

This plug-in gives the user the ability to play a movie in a defined area within a PDF file. Currently, QuickTime and AVI are the supported formats. MPEG is not supported but there are utilities out on the WWW that convert MPEG format to AVI.

Users viewing PDF files with movies control must have the QuickTime 2.0+ or Microsoft Video for Windows software.

How the Movie Plug-In Works

The movie file itself is not embedded in the PDF file. In other words, you are not making the movie file part of the PDF file. You are merely adding a control to the PDF file that will play an external movie file. This is very important to remember. The movie file must travel with the PDF file in order for the control to work. Otherwise, the user will get an error.

If the PDF file is being served over the WWW, the movie file will have to be downloaded before the playback commences.

How to Link to the Movie Control

When creating any kind of link (Bookmarks, Hypertext links, and Forms) you can choose to have them perform an action on a movie control. Links can play, stop, resume, or pause a movie control. A Movie control must exist prior to creating a link to it.
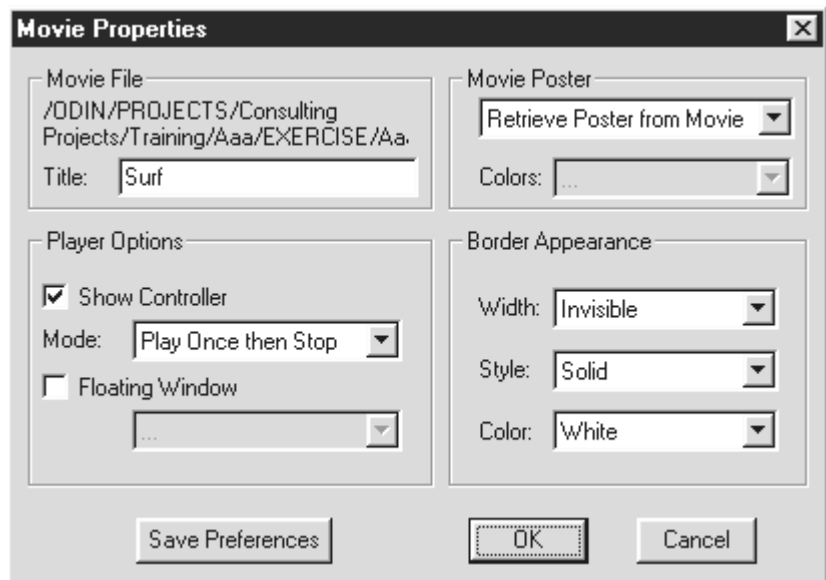
Extending Your Use of Acrobat with Plug-ins

A plug-in is a special piece of add-on software. The plug-ins enhance the functionality of Acrobat. Some products let you create links and bookmarks, add markup annotations, navigate, and copy information. Products like Compose,

Aerial and Re:mark, can help you get your Acrobat processing job done faster; and they let you do things you just can't do with Acrobat alone.

You must first own Adobe Acrobat Exchange before you can use the plug-in products. Some plug-in products work partially with the free Acrobat Reader, but in most cases you need Acrobat Exchange.

Aerial complements and extends Acrobat's navigation, print and text extraction features. Print large spreadsheets or CAD drawings over multiple tiled pages. Copy tables to spreadsheets. Convert PDF text into RTF for editing with Microsoft Word or other word processors. (Note: Aerial works with either Acrobat Exchange or Acrobat Reader. Some features are not available when used with Acrobat Reader) (www.infodata.com). Cost: $49.00.

Compose streamlines your PDF document production. With powerful tools that are easy to use, Compose automates repetitive tasks like bookmarking, hypertext link creation and more. See a review of Compose in Jan/Feb 97 issue of Adobe Magazine. Compose is a must-have for professional PDF publishers and CD-ROM creators. (Note: Compose does not work with the free Acrobat Reader) (www.infodata.com). Cost: $495.00

Re:mark is a redlining tool for document review in a workgroup setting. Add annotations like hilites, strike-thrus and comments directly on the screen and eliminate paper drafts completely. Now you can distribute documents for review, and receive comments back electronically. (Note: Re:mark does not work with the free Acrobat Reader) (www.infodata.com). Cost: $129.00

HIGH END MULTIMEDIA

9

W hat does both the entertainment industry and the manufacturing industry have in common? They have been the early adopters of high-end multimedia products and systems. Examples are fly-bys around Saturn, inner workings of jet engines, Hubble telescope images, and computer animated modeling of DNA cells and structures – even CAT scans and MRI imaging. These products are typically created with CAD/Modeling-based systems.

HIGH END MULTIMEDIA DEVELOPMENT ENVIRONMENTS

The early adopters of this technology were the scientific community more than any other. These people invented the technology they *needed* to solve their own research visualization problems.

RUSSELL GALWOOD   TGALWOOD@NWLINK.COM
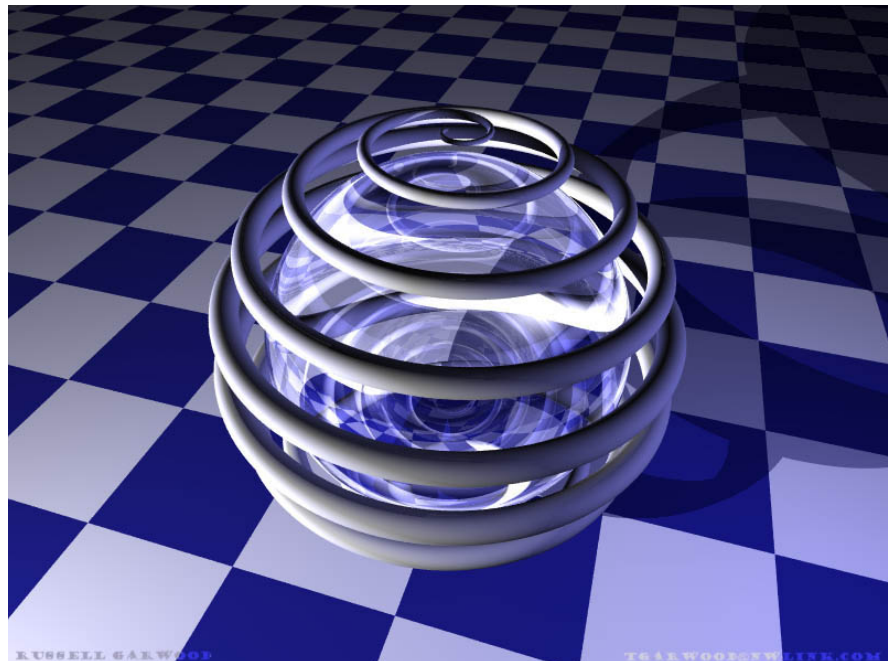
In this section, high-end graphics will be discussed, as well as high-end multimedia authoring systems.

Computer-Aided Design

A great example is in the building industry. For instance, most people cannot visualize what a construction project will look like after completion by simply looking at a set of construction plans or two-dimensional elevation drawings. Computer-generated 3-D renderings solve this problem. They are also much more accurate than the average hand-drafted rendering since they are modeled using CAD (Computer-Aided Design) technology, therefore generating perspective views with correct object placement and shadow casting from any given point of view. Another advantage over hand drawings is that if additional renderings from different points of view are desired, or if revisions need to be made to the final rendering, all that needs to be done is to reposition and/or modify the computer model as desired and render it again.

This section offers an introduction into this world. If you wish to learn more about these topics, please follow the links in the documents.

3D Graphics

In all high-end multimedia, the roots are in 3D Graphics. What's 3D graphics, anyway? It is the creation and combination of geometry, transformations, attributes, lighting, shading, and textures.

Geometry is defined by XYZ coordinates and some additional semantics. Geometry has properties - specifically, "material" properties describe how light reflects of off the surface of an object.

Transformations (scale, rotate, translate) can be used to position and scale objects in relation to others.

Lighting is the process of determining how much light strikes an object and how much should be reflected. There are spot lights, light bulbs and sun light. There is also ambient light to simulate what we call diffuse light. These different lighting effects can be combined to create realistic shadows, rather than harsh, hard edge shadows.

Shading determines how the colors - determined in the lighting step – are spread across the surface.

Texture is the tactile nature of the surface, and this has an effect on the subtle shading and lighting properties in the rendered graphic.
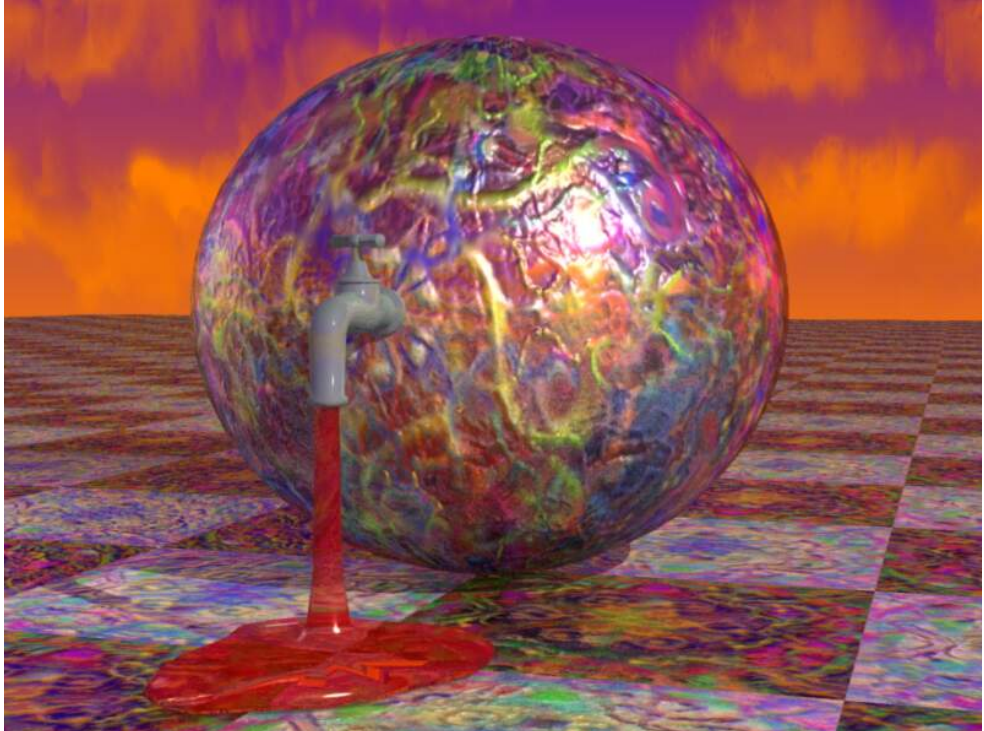
Virtual Reality and Simulation Systems

Virtual Reality is high-end graphics that humans can experience with the use of visors, gloves and other body systems. An example that is in use at Chrysler today is one of modeling the interior of new automobiles and testing the human factors of the design before the car is manufactured! The U.S. Department of Defense has really been in the forefront of creating computer simulations for training purposes. Lots of simple mistakes can be alleviated, resulting in lower overall costs, using this technology.

The backbone of these systems is Computer-Aided Design. Again, special purpose software is developed specifically for this use. A company known for its innovative workstations and software is Silicon Graphics (http://www.sgi.com) and Intergraph Corporation (http://www.intergraph.com).

Pixar

One company that has created and perfected the 3D modeling and animation market is Pixar (http://www.pixar.com). This is the company that was created by Steve Jobs (Apple) and has brought wonderful animated classics such as Toy Story. Luxo Jr. (1986) was the first three-dimensional computer animated film to be nominated for an Academy Award, in addition to winning some 20 awards at international film festivals. It includes several technical achievements in computer animation, most notably self-shadowing, where an image accurately casts shadows onto itself. Final images were rendered with multiple light sources and motion blur.
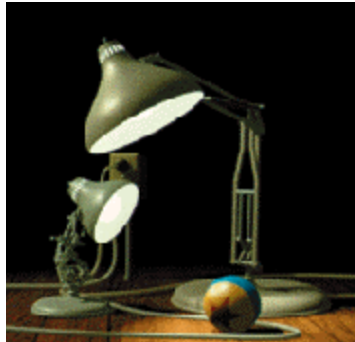
Tin Toy (1988) is the first computer animated film ever to win an Academy Award. It tells the humorous story of a wind-up toy's first encounter with a boisterous baby. Animation of the baby's facial expressions was accomplished by defining more than 40 facial muscles on the computer which the animator controls.

The tools that Pixar uses are ones that they created themselves – and they are expensive! The RenderMan suite of tools is $8,500.00. RenderMan is the Academy Award-winning software used by motion picture and television studios to create realistic visual effects. Used in conjunction with popular modeling and animation software, Pixar's RenderMan has allowed digital design studios to create landmark visual effects such as the cyborg in Terminator 2, the dinosaurs in Jurassic Park and the animals in Jumanji.

Pixar's RenderMan was engineered from the onset to create the world's most compelling and highest quality computer generated images for use in feature film and television effects. RenderMan images are free from the typical computer defects of aliasing, strobing and unrealistic visual simplicity. Instead, RenderMan images are capable of representing subtle visual attributes such as materials and textures, the influence of various types of lights from multiple sources, shadows, camera effects and other features not properly described by shape alone.

In 1995 Pixar released Toy Story, the world's first entirely computer generated feature film. The entire film was rendered with RenderMan, because it is the only renderer currently available that is robust enough to create a feature film. The complex, realistic 112,000 frames in Toy Story contained more than 400 models, more than 1,500 RenderMan shaders and over 2,000 texture maps. A model file for a typical frame in this movie was 15MB, far more complex than can be handled by most commercially available rendering systems. The computer hardware that is used is also specialized, created by Silicon Graphics (http://www.sgi.com), although many Unix platforms can also be used. Sometimes rendering is accomplished over hundreds of machines at the same time!

Titanic

Bringing James Cameron's period epic to the screen required the ultimate in special effects. A computer-generated ocean, thousands of computer-generated extras on deck, and match-moving the shots of actors on a deck set-piece with a 45-foot ship's model were the work of a large creative team. In fact, even the "fog breath" from the actors was computer-generated. More than 300 Silicon Graphics workstations were used by digital artists running software from Alias|Wavefront, Softimage, Avid and Side Effects for content creation and compositing.

VRML – Virtual Reality Modeling Language

VRML stands for Virtual Reality Modeling Language. It is usually pronounced "V R M L", but its friends pronounce it "vermel." The goal of VRML is to create the infrastructure and conventions of cyberspace, a multi user space of many virtual worlds on the Net. Just as HyperText Markup Language (HTML) led to a population explosion on the Internet by implementing a graphical interface, VRML adds the next level of interaction, structured graphics, and extra dimensions (z and time) to the online experience. The applications of VRML are broad, ranging from prosaic business graphics to entertaining web page graphics, to manufacturing, scientific, entertainment, and educational applications, and of course to 3D shared virtual worlds and communities.

VRML, sometimes pronounced vermal, is an acronym for the Virtual Reality Modeling Language. Technically speaking, VRML is neither virtual reality nor a modeling language. Virtual reality typically implies an immersive 3D experience (such as a head-mounted display) and 3D input devices (such as digital gloves). VRML neither requires nor precludes immersion. Furthermore, a true modeling language would contain much richer geometric modeling primitives and

mechanisms. VRML provides a bare minimum of geometric modeling features and contains numerous features far beyond the scope of a modeling language.

So if VRML is not virtual reality or a modeling language, what is it? There are several answers to this question. At its core, VRML is simply a 3D interchange format. It defines most of the commonly used semantics found in today's 3D applications such as hierarchical transformations, light sources, viewpoints, geometry, animation, fog, material properties, and texture mapping. One of the primary goals in designing VRML was to ensure that it at least succeeded as an effective 3D file interchange format.

The second answer is that VRML is a 3D analog to HTML. This means that VRML serves as a simple, multiplatform language for publishing 3D Web pages. This is motivated by the fact that some information is best experienced three dimensionally, such as games, engineering and scientific visualizations, educational experiences, and architecture. Typically these types of projects require intensive interaction, animation, and user participation and exploration beyond what is capable with a page-, text-, or image-based format (i.e., HTML).

Another answer is that VRML provides the technology that integrates three dimensions, two dimensions, text, and multimedia into a coherent model. When these media types are combined with scripting languages and Internet capabilities, an entirely new genre of interactive applications are possible. A 3D metaphor presents a natural user experience that supports classic two-dimensional (2D) desktop models as well as extends into broader contexts of space and place. Many have speculated that the 3D world model will supersede and thus replace the popular 2D desktop model as the primary user interface paradigm in the next decade. Of course, there are a variety of challenges that need to be overcome before this is possible, such as 3D user interface and navigation, user training, and ubiquitous 3D graphics performance.

Sources of VRML Information

VRML Repository (URL is http://www.sdsc.edu/vrml/).

The VRML Consortium (URL is http://www.vrml.org) VRML-o-Rama!! (URL is http://www.well.com/user/spidaman/vrml.html) is a collection of links & personal notes.

WWW Viewer Test Page provides sample URLs for a wide variety of content. This allows you to test your browser and how it hands data off to helper applications. It

also has some other MIME pointers. Check out (URL is http://www-dsed.llnl.gov/documents/WWWtest.html)

The Mesh Mart has a catalog of objects. They also maintain an excellent list of pointers in the VRML page. (URL http://www.meshmart.org/)

Viewpoint Datalabs has a library of models and software. (URL is http://www.viewpoint.com)

Multimedia Authoring Systems

An Authoring System is a program which has pre-programmed elements for the development of interactive multimedia software titles. Authoring systems vary widely in orientation, capabilities, and learning curve. There is no such thing (at this time) as a completely point-and-click automated authoring system; some knowledge of heuristic thinking and algorithm design is necessary. Whether you realize it or not, authoring is actually just a speeded-up form of programming; you don't need to know the intricacies of a programming language, or worse, an API, but you do need to understand how programs work.

Each of these authoring programs work with a different paradigm, or an authoring metaphor. This is the methodology by which the authoring system accomplishes its task. There are various paradigms, including:

- Scripting Language - The Scripting paradigm is the authoring method closest in form to traditional programming. The paradigm is that of a programming language, which specifies (by filename) multimedia elements, sequencing, hotspots, synchronization, etc. A powerful, object-oriented scripting language is usually the centerpiece of such a system; in-program editing of elements (still graphics, video, audio, etc.) tends to be minimal or non-existent. The scripting paradigm tends to be longer in development time (it takes longer to code an individual interaction), but more powerful interactivity is possible.

- Iconic/Flow Control - This tends to be the speediest (in development time) authoring style; it is best suited for rapid prototyping and short-development time projects. Many of these tools are also optimized for developing Computer-Based Training (CBT). The core of the paradigm is the Icon Palette, containing the possible functions/interactions of a program, and the Flow Line, which shows the actual links between the icons. Macromedia Authorware or IconAuthor, are extremely powerful examples of this type.

- Frame - The Frame paradigm is similar to the Iconic/Flow Control paradigm in that it usually incorporates an icon palette; however, the links drawn between

icons are conceptual and do not always represent the actual flow of the program.

• Card/Scripting - The Card/Scripting paradigm provides a great deal of power (via the incorporated scripting language) but suffers from the index-card structure. It is excellently suited for Hypertext applications, and supremely suited for navigation intensive applications. Such programs are widely used for shareware applications.

• Cast/Score/Scripting - The Cast/Score/Scripting paradigm uses a music score as its primary authoring metaphor; the synchronous elements are shown in various horizontal "tracks" with simultaneity shown via the vertical columns. The true power of this metaphor lies in the ability to script the behavior of each of the cast members. The most popular member of this paradigm is Macromedia Director, which is used in the creation of many commercial applications. These programs are best suited for animation-intensive or synchronized media applications.

• Hierarchical Object - The Hierarchical Object paradigm uses a object metaphor (like OOP) which is visually represented by embedded objects and iconic properties. Although the learning curve is non-trivial, the visual representation of objects can make very complicated constructions possible.

• Hypermedia Linkage - The Hypermedia Linkage paradigm is similar to the Frame paradigm in that it shows conceptual links between elements; however, it lacks the Frame's visual linkage metaphor.

• Tagging - The Tagging paradigm uses tags in text files (for instance, SGML/HTML and WinHelp) to link pages, provide interactivity and integrate multimedia elements. They tend to have limited tracking capability and are best suited to online reference material like dictionaries and manuals.

Windows Authoring Systems

• Authorware: Macromedia; Mac, Windows, WWW (via Shockwave). This follows the iconic/flow control paradigm with a limit per individual file of 32,000 icons. Authorware supports jumping between files (the maintainer has worked on projects greater than 100 MB in content), jumping out to applications and even printing from them. This has unparalled external media support, and can encapsulate all non-motion media content into applications and content libraries, or leave media files external for dynamic access. Authorware supports character-styled text and extensive navigation structures

including hypertext. This tool is optimal for CBT and rapid prototyping; 4.0's big plus is (Win-32 only) ActiveX support for the Oracle Video Server (http://www.macromedia.com/) Full Suite (with Director and other software packages - $2999.00.
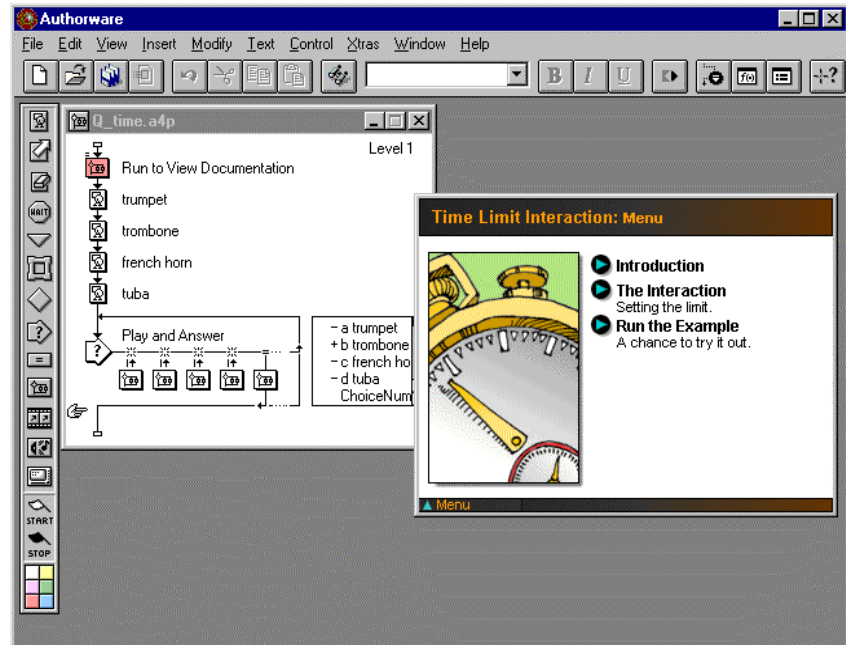
- Director: Macromedia; Mac, Windows, WWW (via Shockwave). This popular general market product follows the cast/score/scripting paradigm, which makes it the tool of choice for animation content. Its roots as a cel- and sprite-animation program are unmistakable; and its inclusion of Lingo, its object-based scripting language, has made it the animation-capable program to beat. The AfterBurner compression Xtra creates Shockwave files, allowing Web playback (http://www.macromedia.com/) $995.00.

- Flash: Macromedia; Mac, Windows, WWW (via Shockwave) Flash is a cast/score/scripting tool, which primarily uses vector graphics (and can create vector graphics from imported bitmaps). It is optimized for Web delivery, and is especially common for banner adds and small interactive web deliverables (http://www.macromedia.com/) $299.00.

- HyperStudio; Roger Wagner Publishing; Mac, Windows. HyperStudio is a card/scripting paradigm authoring system, optimized for and focussed on the educational market (www.hyperstudio.com) $199.95.

- IMedia infoShip; Windows 3.x, 95, NT. Allows users to use page layout tools and then bring the pages into a multimedia environment. Features cross-platform distribution, automatic indexing and storage of page-oriented documents (www.infoship.com) $589.00.

- QuarkImmedia: Quark; PowerMac, Windows Player. QuarkImmedia is a frame paradigm authoring system, designed for re-purposing print (QuarkXPress) documents. If you are a Quark user – this is your tool! (www.quark.com) $660.00.

- Toolbook: Asymetrix; Windows, WWW. Toolbook is a card/scripting authoring system now broken into components: Instructor, the standard tool; Assistant, the pre-built templates, and Librarian, a course-management system. Toolbook includes database linkage, MCI compliance and many examples (called "Widgets") of interactivity. This newest version exports HTML and Java for Web delivery (http://www.asymetrix.com) $2495.00

- IconAuthor: Asymetrix; Windows, NT, UNIX, WWW (via Windows). IconAuthor follows the iconic/flow control paradigm. It is notable for its SmartObject editor, which tags content files (still graphics, RTF text, etc.) for interactivity. It has the option to either embed content files or leave them external in specified directories. The biggest strength of this program is its included data handling, which makes it unparalleled for CBT data tracking (http://www.asymetrix.com) $3995.00.

• Ray Dream 3D is a 3D rendering program that can model objects, textures and light sources.
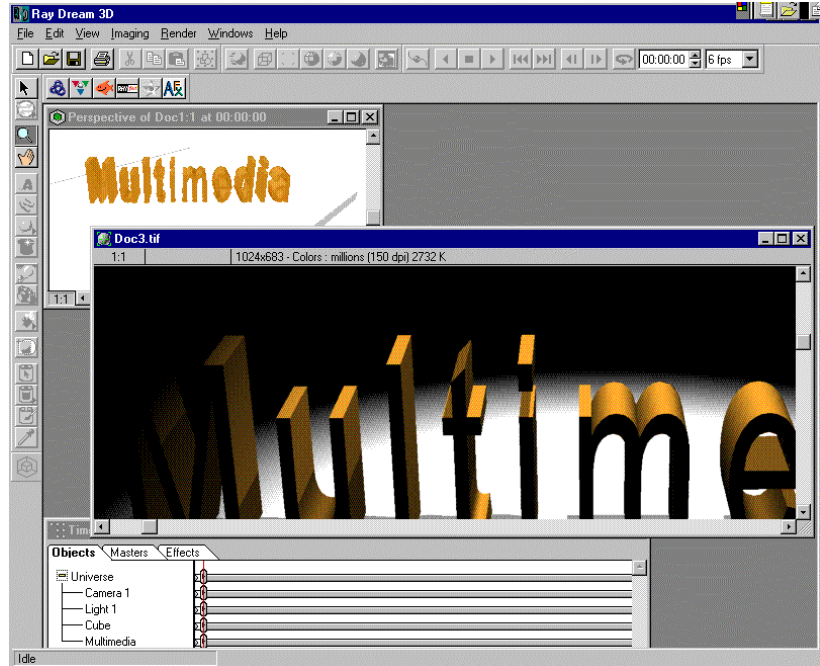
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COPYRIGHT ISSUES

<div style="text-align: right; font-size: large;">10</div>

*E*ducators and students are advised to exercise caution in using digital material downloaded from the Web in producing educational multimedia programs or homepages, since there is a mix of works protected by copyright and works in the public domain. Access to works on the Web does not automatically mean that the information can be reproduced and reused without permission or royalty payment and, furthermore, some copyrighted works may have been posted to the Web without the authorization of the copyright holder.

Statement by Martha Day, Member, CCUMC Government Regulations and Public Policy Committee, January 1997.

COPYRIGHT AND FAIR USE ISSUES IN DIGITAL ENVIRONMENTS

The issues of copyrights in the electronic world are at the center of much debate in legal, artistic and educational circles. Copyright law is based in the United States Constitution, Article 1, Section 8. The intention of copyright is "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries..." Exclusive rights include the rights of reproduction, preparation of derivative works, distribution, public performance, and public display. Within the Constitution's concern for authors' exclusive rights is an equal concern for rights of users of copyrighted information. Congress included its first codification of what might constitute reasonable users' rights in the Copyright Act of 1976, Section 107 (see below).

Section 107. Limitations on Exclusive Rights: Fair Use

Notwithstanding the provisions of Section 106, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include: 1. the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; 2. the nature of the

copyrighted work; 3. the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and 4. the effect of the use upon the potential market for or value of the copyrighted work.

— United States Copyright Act of 1976

Application and Guidelines

Applying the four factors of fair use in any given instance is usually not simple. The only sure method of establishing a particular action as fair use is through litigation. However there are guidelines for behavior that have been generally agreed to be a baseline of safe practice. Guidelines vary according to the particular function of the copying, such as classroom copying, personal research, or the creation of course reserves. It allows users of copyrighted materials--teachers, students, scholars, artists--to use copyrighted materials without seeking permission from the creator or publisher and without paying copyright fees. Fair use allows scholars to draw on the work of others in advancing a new argument, reviewers to criticize, artists to parody, teachers to acquaint students with fresh insights. It is critical for the advance of knowledge and for quality education. Of course there are limitations, the most basic of which is that the use cannot significantly undercut what the creator or publisher might gain from commercial sale of the work. The guidelines also differentiate between individual and institutional behavior.

Unfortunately the guidelines that have been widely agreed upon for many years are now subject to heated debate because they were developed for use with material produced in a primarily print environment. From 1994-1997 the higher education community engaged in intense discussions with associations representing rights holders in the Conference on Fair Use (CONFU).

CONFU is attempting to work out guidelines for `fair use' in educational and library settings now that digital, networked communication and publishing is becoming common, much as, twenty years ago, with photocopy and videotape technology becoming prevalent, guidelines were negotiated for fair use in educational and library settings.

On May 19, 1997, the Conference on Fair Use (CONFU) concluded that the guidelines that had been under development for more than two years had failed to achieve consensus support. The proposed guidelines, negotiated by various copyright stakeholders representing creators, publishers, and users of information, sought to interpret fair use in the development of multimedia works, the creation and use of digital images, and the transmission of digital media in distance education. An interim report published by the U.S. Patent and Trademark Office

documents the CONFU process. The interim report may be viewed at
http://www.uspto.gov/web/offices/dcom/olia/confu/.

Using electronic versions of copyrighted materials

There are a few considerations that you should keep in mind when using electronic versions of copyrighted materials in an educational setting:

1 **Every piece of information that is fixed in a tangible medium, whether print, magnetic tape, or digital, is copyrighted - even listserv postings. No copyright notice is required for the material to be copyrighted. Just because something is on the Internet does not mean that is it not copyrighted.**

2 **One can do anything with the permission of the rights holder. See http://www.cetus.org/fair7.html**

3 **The author is not always the rights holder. If you are the author you may have assigned the copyright to the publisher as part of the terms under which the information was published. You therefore no longer own the rights to your creation and you cannot use it in ways that are contrary to your agreement with the legal rights holder.**

4 **URL links are not covered by copyright. Links may be freely made. However use of a trademark/logo as the link is not permitted.**

5 **Classroom copying guidelines state that copying should meet tests for brevity, spontaneity, and cumulative effect. Copying the same item from term to term is not permissible. Copying of works intended to be "consumable" in the course of study is not permissible. See http://www2.ncsu.edu/ncsu/provost/info/policies/copyright.html**

6 **Works in the public domain are not copyrighted. Public domain works include all works produced by the federal government. Some research reports of work funded by government agencies are in the public domain even though they appear in a commercial journal. One should verify the status of reports of government funded research. Materials on which the copyright has expired are also in the public domain. Generally speaking works published more than 75 years ago are in the public domain. See http://www.benedict.com/fund.htm#fund**

7 **Fair use in the development of multimedia presentations is a complex issue. Most experts believe that use of materials in a variety of media for the preparation and display of classroom presentations can be made without permission. However if that presentation is broadcast beyond the other members of the class, or posted on the Internet for open access, the audience**

is no longer clearly defined as "educational." It is unlikely to be fair use. See
http://WWW.PeachNet.EDU/admin/legal/copyright/copy.html#part2e8

8 **Copying of computer software is permissible only when it is an essential step to utilize that program in conjunction with a machine, i.e. to load it on a hard drive, etc., or for archival purposes. In addition to limitations of fair use, one must consult the license agreement for that software to be sure that one uses the program in accordance with the license contract.**

The following are sources of information regarding copyright issues in the electronically-connected world of today.

Copyright and Fair Use
http://fairuse.stanford.edu/

Fair Use Guidelines for Educational Multimedia and Related Documents and Links
http://www.libraries.psu.edu/avs/fairuse/default.html

Basic Principles for Managing Intellectual Property in the Digital Environment
http://www-ninch.cni.org/ISSUES/COPYRIGHT/PRINCIPLES/NHA_Complete.html

The Intellectual Property and Technology Forum
http://infoeagle.bc.edu/bc_org/avp/law/st_org/ipg/iptf/

The Conference on Fair Use - an Interim Report to the Commissioner
http://www.uspto.gov/web/offices/dcom/olia/confu/interim.html

Copyright and Fair Use: Fair Use and Multimedia
http://fairuse.stanford.edu/multimed

Copyright and Fair Use in the Digital Age
http://www.educo.edu/web/pubs/review/reviewArticles/30132.html

Copyright and Multimedia Law for Webbuilders and Multimedia Authors
http://www.lib.uiowa.edu/proj/webbuilder/copyright.html

The Copyright Clearance Center
http://www.copyright.com/

Submitting Your Documents to DTIC

First and foremost, before you begin developing the most incredible multimedia document ever seen – check with your local DTIC library to find out what the status is regarding acceptance of files. Whatever the acceptable local standard is for submittal, you must comply. Given the explosion of new technology, DTIC will be altering their submission standards to accommodate these new formats.

While everyone may be submitting a different document type, there are some very basic considerations and standards for all file types.

Decide on the Best Option for Submittal

If your document was created with a traditional publishing package like Word Perfect or Word, or PowerPoint, you should consider submitting your document in Acrobat format. It is multi-platform ready and can easily be added to Web sites for dissemination. In addition, you can be assured that the file will print accurately not matter where it is printed.

Collecting the Files and Programs

In some cases you may be linking from within one application to another. This is the case with Acrobat and movie files. It is very important that whatever application you choose to use, make sure the external files are in a relative location to the core document.

A first step in making sure you won't forget anything is to maintain a list of all the files and applications necessary to experience your document. It is easier to start this list online during the beginning of your project and just add to it along the way. Make sure that you note the file name, type and application necessary for viewing it. Don't forget to identify the specific version of the software either. Software changes frequently these days and you want to alleviate any frustration that your audience may feel.

This list will eventually turn into a "read me" document that you will submit along with the full project. Make sure you include any specialty software that your project needs (within the bounds of the license agreement). Many software packages have freely available viewers for their specific file format. Adobe has an Acrobat viewer for PCs, Macs, and Unix machines. There are also Word and PowerPoint viewers, although these are limited in the available platforms. You

may want to choose Acrobat as the submittal format because it is so portable across platforms and lives equally well on the Web and CD.

Transmitting the Document Project to DTIC

Well, if you've added 4 sound clips, 3 movies and lots of photographs to your document, you will see that the file size grows dramatically!. You have various options for submittal, but both center around creating a single executable for the submittal process. First, of course, you must make sure that you have all the files (including the read me file).

You can create a ZIP file (compressed file) and then ftp (file transfer protocol) the file to your appropriate submittal point, or you can create a self-extracting executable. In some cases, your application will necessitate your submittal of it on CD (Compact Disc). If this is the case, clear it first with your local librarian.

Remember, there are specific ways of creating a CD that enable its use on multiple platforms. Check with your local technical support team for assistance on this matter.

Contacting DTIC

DTIC Web Page: http://www.dtic.mil/

E-mail help: help@dtic.mil

Help Line: 1-800-CAL-DTIC (225) 3842

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APPENDIX

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This Appendix includes two parts. The first gives definitions of common file extensions. The second lists Freeware and Shareware that can be used with many of these file types.

DEFINITIONS OF EXTENSION

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The following chart contains a list of common file name extensions and a brief description of their format or purpose. Also included are some programs that can be used to open these files for both the Macintosh and Windows platforms. The section following this chart gives a brief description of the programs listed with URL links to sites the programs can be downloaded from.

If you are viewing this document in PDF format, simply click on the program name (highlighted in blue) to jump to that programs description and URL link.

.File Suffix	Format Description & Type	Some Programs that can be used
.ai	Adobe Illustrator Artwork	Macintosh: Adobe Illustrator
		Windows: Adobe Illustrator
.aiff	.aiff is a semi-common sound format. Binary	Macintosh: Use Sound Player to play it.
		Windows: Use Waveform Hold and Modify to play it
.au	au is the most common sound format found on the web. Binary	Macintosh: Use Sound Player to play it.
		Windows: Use Waveform Hold and Modify to play it
.avi	Movie Clip (AVI)	
		Windows: MS Win95 (RUNDLL32)
.bin	Macbinary II Encoded File. Make sure to download as MacBinary or Binary.	Macintosh: Use Stuffit Expander to turn back into a usable Macintosh file if it isn't already.
		Windows: N/A
.bmp	Bitmap Image	Macintosh:
		Windows: MS Paint, Photoshop, etc.

.File Suffix	Format Description & Type	Some Programs that can be used
.doc	May be a DOS/Windows program or a DOS/Windows Self Extracting Archive Binary	Macintosh: Use MS-Word
		Use WordView to quickly display MS-Word documents
.exe	May be a DOS/Windows program or a DOS/Windows Self Extracting Archive Binary	Macintosh: N/A
		Windows: Download and launch it in its own temporary directory, it may spawn a number of files and directories. Self Extracting
.gif	GIF (Graphical Interchange Format), though not the most economical, is the most common graphics format found on the Internet.	Macintosh: Use GIFConverter or JPEGView
		Windows: Use Lview Pro or PolyView to view these graphics. Also paint programs such as Adobe Photoshop, Paint Shop Pro, MS Paint.
.gz	.gz is the Gnu version of zip. It is a compression method developed for use on UNIX systems. Binary	Macintosh: Use macgzip to view and extract archives.
		Windows: Use WinZIP view and extract archives.
.html .htm	HTML (Hypertext Markup Language), the code the web is written in. Plain text file.	Macintosh: Use Netscape for Macintosh to view the file
		Windows: Use Netscape for Windows95 and Windows NT to view the file
.hqx	BinHex 4.0 - Encodes a Macintosh file into 7-bit text so it can be safely transferred. Most Mac files appear in .hqx	Macintosh: Use Stuffit Expander
		Windows: Use BinHex13 in a DOS window to un-binhex it
.image	Macintosh Disk Image, most commonly found on Apple's FTP sites. Binary	Macintosh: Use ShrinkWrap to mount the disk image, and deal with it like you would a floppy
		Windows: N/A
.jpg .jpeg .jfif	JPEG/JFIF, a 24 bit graphic format Binary	Macintosh: Use JPEGView
		Windows: Use Lview Pro or PolyView to view these graphics. Also paint programs such as Adobe Photoshop, Paint Shop Pro, MS Paint.
.dll	Dynamic Link Library	Macintosh:
		Windows: Comes with or added to the operating system.

.File Suffix	Format Description & Type	Some Programs that can be used
.mid .rmi	MIDI Sequence	Macintosh:
		Windows: MS Win95 (RUNDLL32)
.mpg .mpeg	MPEG, the standard movie platform for the 'net. Binary	Macintosh: Use Sparkle to play them, or to convert them to QuickTime.
		Windows: Use NET TOOB or Ladybug to play MPEGs
.mov .qt .movie .moov	QuickTime Movie, Apple Macintosh native movie platform Binary	Macintosh: Use Sparkle, FastPlayer, MoviePlayer, SimpleText, MicrosoftWord...and many others. If the movie appears totally white, you may need to use the Apple Quicktime VR Player to see them.
		Windows: Use QuickTime for Windows
.pcx	PCX Image Document	Macintosh:
		Windows: Microsoft Paint
.pdf	Adobe Acrobat Portable Document Format, download as Binary	Macintosh: Use Adobe Acrobat Reader or Adobe Acrobat Exchange
		Windows: Use Adobe Acrobat Reader or Adobe Acrobat Exchange
.ps	Postscript file. Plain text file, but not really human-readable.	Macintosh: Send to a Postscipt printer with Laserwriter Font Utility or view it on-screen using Ghostscript
		Windows: View it onscreen using Ghostscript
.psd	Adobe Photoshop Image	Macintosh: Adobe Photoshop
		Windows: Adobe Photoshop
.qt	QuickTime Movie, Apple Macintosh native movie platform Binary	Macintosh: Use Sparkle, FastPlayer, MoviePlayer, SimpleText, MicrosoftWord...and many others. If the movie appears totally white, you may need to use the Apple Quicktime VR Player to see them.
		Windows: Use QuickTime for Windows
.ra .ram	RealAudio File	
		Windows: Real Audio Player

.File Suffix	Format Description & Type	Some Programs that can be used
.sit	Stuffit Archive - Binary	Macintosh: Download as MacBinary, and use Stuffit Expander
		Windows: Use UnSit in a DOS window
.sea	Macintosh Self Extracting Archive	Macintosh: Download as MacBinary, and launch it. Self Extracting
		Windows: N/A
.tar	UNIX tar program takes separate files and turns them into one file. Often also compressed. Extensions such .tar.Z, .tar.gz and .tgz (latter two are equivalent) requires decompression first, then un-tar. Some UNIX ftp servers will un-tar a file if you request it without the ".tar" extension. Binary	Macintosh: Download and use Tar
		Windows: Use WinZIP to view and extract archives.
.tiff .tif	TIFF is a very large high quality image format. Binary	Macintosh: Use JPEGView
		Windows: Use Lview Pro or PolyView to view these graphics. Also paint programs such as Adobe Photoshop, Paint Shop Pro, MS Paint.
.txt	A plain boring old Text File	Macintosh: Use Microsoft Word, Simple Text, BBEdit, whatever!
		Windows: Use the 16 or 32 bit version of Programmer's File Editor
.uu .uue	A uuencoded file. Typically this is done on a UNIX command line: uuencode OriginalFileName SecondFilename > EncodedFile.uu Then, after running: uudecode EncodedFile.uu One gets a file generated named: SecondFileName Using .uu as the extension is not required but is considered politely explanatory for what type of file it is. Increasing numbers of desktop mail and newsreading programs will handle this type of encoding on the fly.	Macintosh: Use UU Undo to uudecode it
		Windows: Use WinCode or ESS-Code to uudecode it
.vdo	VDOLive Script	
		Windows: Video Live 32

.File Suffix	Format Description & Type	Some Programs that can be used
.wav	Windows Wave format sound file Binary	Macintosh: You can use SoundApp to play .wav files
		Windows: Use Waveform Hold and Modify to play it
.z	Unix Compressed File Binary	Macintosh: If you are downloading via ftp most ftp servers will uncompress for you if you drop the ".Z". Otherwise use Stuffit Expander w/EE.
		Windows: Use WinZIP to view and extract archives.
.zip	pkzip, a common DOS/Windows compression format Binary	Macintosh: Use ZipIt, Stuffit Expander w/ EE, or MacUnZip
		Windows: Use WinZIP to view and extract archives.

FREEWARE AND SHAREWARE
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This section lists a variety of useful software programs that are available for download off the Web. Most are Freeware or Shareware.

Adobe Acrobat Reader

Freeware program from Adobe to read Adobe Acrobat Portable Document Format files.

Source site: http://www.adobe.com/Software/Acrobat/

BinHex13

Use this in a DOS window to get the original file.

ftp://oak.oakland.edu/pub/simtelnet/msdos/mcintosh/

http://bang.lanl.gov/win/

http://www.cyf-kr.edu.pl/mirr-html/simtel/simtel_mcintosh.html

ESS-Code

A Windows 32 bit program. Allows drag and drop uuencoding/decoding and MIME support. Look for tile name like ecdXXw95.zip where XX is a version number

http://www.geocities.com/CapitolHill/2171/

ftp://ftp.cica.indiana.edu/pub/pc/win95/txtutil/

Ghostscript

Freeware program for viewing Postscript files on screen, saving to PICT format, etc. The program requires that you install a large (~6 MB) collection of files though. It also crashes a lot.

Macintosh source site:
http://www.glyphic.com/glyphic/projects/macgs.html

To run Aladdin Ghostscript on a PC you need gs###ini.zip, gs###fn1.zip and one of gs###dos.zip, gs###os2.zip, gs###win.zip or gs###w32.zip. Be sure to read the README and Index files in this directory.

ftp://ftp.cs.wisc.edu/ghost/aladdin/

GIFBuilder

For Mac users. This is a freeware program.
http://iawww.epfl.ch/Staff/Yves.Piguet/clip2Gif-home/GifBuilder.html

GIFConverter

Shareware program (~$30) for viewing and converting between GIF, PICT, TIFF, RLE, JPEG (JFIF), EPSF, RIFF, Macpaint, StartupScreen and "Scan Image" formats. Some primitive file editing can be done such as cropping and re-sizing (scale-by-percent) and adjusting file resolution and dither pattern. GIFConverter will save GIFs in Interlaced format if you choose, but cannot handle transparent colors.

The main site:
http://www.kamit.com/gifconverter.html

Alternate:
http://www.macworld.com/cgi-bin/software.pl/Graphics/Software.32.html

JPEGView

JPEGView is a freeware graphic program to read GIF, JPEG, TIFF, and PICT files. Runs fast and will dither nicely to any size of screen/color palette.

Source Site:
http://www.macworld.com/software/Software.832.html

Via FTP:
ftp://wuarchive.wustl.edu:/systems/mac/umich.edu/powermac

Ladybug

The Ladybug 1.00 for Windows95 can only play MPEG files less than 800KB but it looks promising, watch for updates.

http://www.alberts.com:8081/AuthorPages/00013277/Prod_170.htm

Laserwriter Font Utility

This comes with your Macintosh. It's on the Printing Tools disk, or it may already be installed in your Utilities folder. If you need to download it from Apple, you can.

Source site: http://www.support.apple.com/

Lview Pro

Lviewpro provides support for a variety of graphics formats including GIF '89 (transparent backgrounds), conversion between different formats and image editing functions.

Pick it up at
http://www.lview.com/

http://www.geocities.com/CapitolHill/2171/

Netscape

Netscape is a very fast and powerful World Wide Web browser.

http://home.mcom.com/comprod/mirror/index.html

NET TOOB

NET TOOB can play MPEG system layer streams containing both video and audio for Windows 3.x, Windows 95/98/NT and Macintosh.

http://www.bitcasting.com/dl_nt.html

PolyView

PolyView is a Windows NT/95/98 program that displays GIF, JPEG, TIFF, and photo-cd graphics files and converts between these file formats.

http://www.polyview.com/

Programmer's File Editor

Programmer's File Editor is a large-capacity multi-file programming oriented editor for Windows 3.1x, Windows NT on Intel and PowerPC platforms, and Windows 95.

Get the 32 bit version (pfeXXXXX.zip) at
http://32bit.bhs.com/default.asp

QuickTime

QuickTime is Apple's video format. Players for Macintosh and Windows are available.

http://www.apple.com/quicktime/

Quicktime VR Player

This is a QuickTime movie player that will also play QuickTime VR movies

Source Site:
http://www.apple.ccs/quicktime/qtvr/index.html

Real Audio Player

http://www.realaudio.com/

ShrinkWrap

Shrinkwrap is a free Mac utility that allows you to mount and use disk image files as if they were a mounted floppy disk. You can also copy disk images to floppies with Shrinkwrap by simply dragging the floppy icon onto Shrinkwrap.

http://wwwhost.ots.utexas.edu/mac/pub-mac-compression.html#shrinkwrap-142

Sound Player

Sound Player is a multipurpose sound program that can record and play back .au and aiff format sounds.

Source Site:
http://wwwhost.ots.utexas.edu/mac/pub-mac-sound.html

Alternative Sites:
http://www-cs-students.stanford.edu/~franke/SoundApp/#abou

http://www.syntrillium.com/cep/proinfo.htm

http://www.quadmation.com/pphome.htm

SoundApp

SoundApp is a small featureless program that will play most audio files you may find

http://wwwhost.ots.utexas.edu/mac/pub-mac-sound.html

Sparkle

Sparkle is the best MPEG player for the mac. You can play and convert between Quicktime and MPEG.

Source Site:
http://ccsmacinfo.ccs.queensu.ca/MacSDistribution/Sparkle.html

Or try
http://teachnet.edb.utexas.edu/Conferences/TeachNet%20File%20Area/Pop%20Mac%20Software/%231606061

Stuffit Expander with Expander Enhancer

Stuffit Expander is the decompression program for the mac. With Expander Enhancer (It is installed when you install DropStuff) you can expand a LOT of formats!

get both Stuff Expander and Drop Stuff w/ EE from Aladdin at

http://www.aladdinsys.com

Tar

Tar 4.0 will read and write tar files.

gopher://gopher.archive.umich.edu:7055/40/mac/util/compression/tar4.0b.sit.hqx

UNSIT

UNSIT is a simple utility for PC users to extract files from a StuffIt file.

ftp://ftp.cdrom.com/pub/simtelnet/msdos/mcintosh/unsit30.zip

UU Undo

UU Undo is a simple program to decode uu encoded files on the mac.

http://tucows.bealenet.com/mac/compmac.html

Waveform Hold and Modify (WHAM)

WHAM provides support for a variety of formats, conversion between them and file editing functions.

Pick it up from
http://tucows.bealenet.com/softsoun.html

WinCode

Wincode is a Windows 3.x program which converts 8-bit BINARY (EXE, COM,GIF, etc.) files to 7-bit ASCII (Text) files (and vice versa) through a process known as bit-shifting. Wincode currently supports UU/XX and Base64 (MIME 1.0 conformant) coding.

To be had from
http://www.winsite.com/info/pc/win3/util/wincode.zip/

WinZip

WinZip is an essential tool for it's excellent handling of many different archiving and compression formats. Downloads asa self-extracting archive.

Get the 16 or 32 bit version (wzntXX.exe) at
http://www.winzip.com/info.htm

WordView

For MS-Windows users, displaying Microsoft Word documents without having to
allocate the memory resources required to fire up MS-Word is very handy. Get
yours at
ftp://ftp.microsoft.com/Softlib/MSLFILES/

ZipIt

A fast program for the Macintosh to extract and create Zip archives.

Home Site:
http://www.awa.com/softlock/zipit/zipit.html

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APPENDIX

GLOSSARY

3D

With these programs, you take a simple shape and stretch, bend & twist them into 3D models. You can create anything from a rotating square to a realistic dinosaur for a movie with this type of program. Some examples of 3d programs are Macromedia Extreme 3D, 3D Studio Max and Lightwave.

Animated GIF

An animated GIF is a graphic image on a Web page that moves - for example, a twirling icon or a banner with a hand that waves or letters that magically get larger. In particular, an animated GIF is a file in the Graphics Interchange Format specified as GIF89a that contains within the single file a set of images that are presented in a specified order. An animated GIF can loop endlessly (and it appears as though your document never finishes arriving) or it can present one or a few sequences and then stop the animation.

GIFBuilder, a freeware program for Mac user can be found at:
http://iawww.epfl.ch/Staff/Yves.Piguet/clip2Gif-home/GifBuilder.html

GIF Construction Set, a shareware program for Windows users from Alchemy Mindworks, can be found at:
http://www.mindworkshop.com/alchemy/gifcon.html

A number of people maintain lists of animated GIF examples. The Dutchman's Page, http://www.vuurwerk.nl/levon/animated.html, includes a "Top 150 Animated GIFs List." Learn2.com, http://www.learn2.com, is a site that makes intelligent, selective use of animated GIFs to illustrate "how-to" topics.

Applet

On the Web, the term is often "Java applet." But applets existed before the Java programming language arrived. They're simply "little application programs" that are usually built into an operating system or a larger application program. The built-in writing and drawing programs that come with Windows are sometimes called "applets."

With Java, which is a language designed for creating small program objects for a distributed environment like the Web, an applet becomes something that can arrive along with an HTML file. A user can then click on an image and trigger the applet to animate the image or cause a popup window to appear and ask a question, then perform some calculation tailored to the user's input.

AVI

Audio/visual interface. Windows AVI provides the capability to develop animation files that can be included in multimedia presentations and as part of World Wide Web pages. The files (which end with an .avi extension) require a special player which may be already included with your Web browser or may require downloading.

BMP

In a bitmapped graphics file, the color of each pixel is described with one or more bits of information. The number of bits used to record the information for one pixel is called the bit depth of the file.

Since a bit of information can describe only one of two values (0 for off, or 1 for on), a pixel described by one bit can only be either black or white. 8-bit would describe a pixel of one of 256 shades of gray or color (2^8). 24-bit would describe a pixel capable of displaying one of over 16.7 million colors (2^{24}). *See also Raster graphics.*

Browser

A browser is a program that provides a way to look at, read, and even hear all the information on the World Wide Web. The word "browser" seems to have originated prior to the Web as a generic term for user interfaces that let you browse text files online. By the time the first Web browser with a graphical user interface was invented (it was called Mosaic), the term seemed to apply to Web content, too. Technically, a Web browser is a client program that uses the Hypertext Transfer Protocol (HTTP) to make requests of Web servers throughout the Internet on behalf of the browser user. Currently, the most popular browser is Netscape Navigator. Microsoft's Internet Explorer is gaining usage as Windows 95 installations grow. A commercial version of the original browser, Mosaic, is in use. Other browsers include the browsers for the online services, America Online, Compuserve, and Prodigy, but these are beginning to offer Netscape or Internet Explorer in addition to or as a replacement for their own. Lynx is a text-only browser for UNIX shell and VMS users.

BrowserWatch http://browserwatch.internet.com/ is an extremely informative site which enables users to download various browsers, plug-ins and ActiveX controls for all platforms including Macintosh, OS/2, Unix, and Windows.

CCITT

Used for monochrome images, all types of CCITT compression are *lossless.*

CCITT Group 3 compresses monochrome bitmaps one row at a time (the method used by most fax machines).

CCITT Group 4 is a general-purpose method that produces good results for most types of monochrome images.

CGM

Computer Graphics Metafile. CGM is oriented toward stroke drawn graphics, but includes raster bitmap encoding.

Client/Server

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request.

DCS–5

Desktop Color Separation-5 (DCS-5) files are EPSF files that contain separated color information for images (cyan, magenta, yellow, black and a low-resolution preview file). They are most commonly used with QuarkXPress. Placed EPSF files of this type will not produce good-quality PDF files, because only the low-resolution preview file is written into the PostScript language file and appears in the PDF file.

Dithering

Dithering is the attempt by a computer program to approximate a color from a mixture of other colors when the required color is not available. Typically, dithering occurs when a color is specified for a Web page that a browser on an operating system can't support. The browser will then attempt to replace the requested color with an approximation composed of two or more other colors it can produce. The result may or may not be acceptable to the graphic designer. It may also appear somewhat grainy since it's composed of different pixel intensities rather than a single intensity over the colored space.

APPENDIX
B

To understand the colors available with Web browsers, see the 216-color browser safe palette colors and values at whatis.com's web site at http://whatis.com/216color.htm.

DLL

Dynamic link library. In personal computers, a DLL file is a modular program routine that comes with or can be added to your operating system. Each DLL file must have a ".dll" file name extension. DLL files are dynamically linked with the program that uses them during program execution. They don't need to be compiled with the main program. The set of such files (or the DLL) is somewhat comparable to the library routines provided with programming languages such as C and C++.

DVD

Digital versatile disk (DVD), a new optical disk technology that is expected to rapidly replace the CD-ROM disk over the next few years. The digital versatile disk (DVD) holds 4.7 gigabytes of information on one of its two sides, or enough for a 133-minute movie. With two layers on each of its two sides, it will hold up to 17 gigabytes of video, audio, or other information. (The current CD-ROM disk of the same physical size, holds 600 megabytes. The DVD can hold more than 28 times as much information!)

The DVD player will also play regular CD-ROM disks. DVDs can be recorded in any of three formats, variously optimized for: video (for example, continuous movies) audio (for example, long-playing music), or a mixture (for example, interactive multimedia presentations).

EPS

Encapsulated PostScript is a PostScript language file with a "blanket" wrapped around it to make it understandable to applications. EPSF files sometimes include a preview image, which can be color or black and white. These preview images are platform specific; Windows uses the metafile format and the Macintosh uses the PICT format.

Freeware

Freeware is programming that is offered at no cost. However, it is copyrighted so that you can't incorporate its programming into anything you may be developing. The least restrictive "no-cost" programs are uncopyrighted programs in the public domain. These include a number of small UNIX programs. When reusing public domain software in your own programs, it's good to know the history of the program so that you can be sure it really is in the public domain.

GIF

Graphics Interchange Format is an 8-bit format used for Macintosh and PC raster images on CompuServe and other online services. It offers small file sizes for transmission efficiency, but limited color quality makes it unsuitable for most publishing applications.

HTML

HTML (Hypertext Markup Language) is the set of "markup" symbols or codes inserted in a file intended for display on a World Wide Web browser. The markup tells the Web browser how to display a Web page's words and images for the user.

JPEG

JPEG (Joint Photographic Expert's Group) is *lossy* compression. JPEG compression is a technique in which more-detailed parts of an image are compressed less than are less-detailed parts of an image. JPEG compression represents an attempt to reduce the size of an image with a minimum loss of information. However, removal of information from the file reduces image quality.

Continuous-tone images, such as photographs, benefit most from JPEG compression. JPEG compression takes bands or scan lines of the image and compresses them one at a time. It does not determine areas of similar color and compress area by area, as LZW does.

Liteware

Liteware is a term for software that is distributed freely in a version having less capability than the full for-sale version. It's usually designed to provide a potential customer with a sample of the "look-and-feel" of a product and a subset of its full capability. Liteware can be considered a type of shareware (where shareware also includes products distributed freely, usually on a trial basis, that do have full capability).

LZW

LZW (Lempel, Ziv, Welch) provides *lossless* compression. LZW compression simply compresses data; no information is lost. On 8-bit and lower color resolution files, LZW produces file compression. Generally, LZW compression on 24-bit color images produces a larger, rather than smaller, file size. (Distiller's AutoFilter will automatically apply JPEG compression to 24-bit continuous-tone images, even if you have specified LZW.)

Screen shots or images that are mostly large blocks of the same color benefit most from LZW compression. LZW compression takes areas of images that are the same color and compresses them as one piece. Since photographs tend not to have large areas of the same color value, LZW compression is not especially efficient for them.

Metafile

A metafile is a file containing information that describes or specifies another file.

Midi

Musical Instrument Digital Interface. MIDI is a protocol designed for recording and playing back music on digital synthesizers that is supported by many makes of personal computer sound cards. Originally intended to control one keyboard from another, it was quickly adopted for the personal computer. Rather than representing musical sound directly, it transmits information about how music is produced. The command set includes note-ons, note-offs, key velocity, pitch bend and other methods of controlling a synthesizer. The sound waves produced are those already stored in a wavetable in the receiving instrument or sound card.

MIME

MIME (Multi-Purpose Internet Mail Extensions) is an extension of the original Internet e-mail protocol that lets people use the protocol to exchange different kinds of data files on the Internet: audio, video, images, application programs, and other kinds, as well as the ASCII handled in the original protocol, the Simple Mail Transport Protocol (SMTP).

MPEG

MPEG (pronounced M-peg), which stands for Moving Picture Experts Group, is the name of family of standards used for coding audio-visual information (e.g., movies, video, music) in a digital compressed format.

The major advantage of MPEG compared to other video and audio coding formats is that MPEG files are much smaller for the same quality. This is because MPEG uses very sophisticated compression techniques.

PICT

Apple's file format for display of 72-dpi bitmapped graphics. PICT data is one element of high-resolution EPS files, enabling the PostScript image to be displayed on screen.

PNG

PNG (pronounced PING) is a file format for compressed graphic images that, in time, is expected to replace the GIF format that is widely used on today's Internet. The GIF format, patented by Compuserve (which is now owned by America Online), and its usage in image-handling software involves licensing or other legal considerations. (Web users can make, view, and send GIF files freely but they can't develop software that builds them without an arrangement with Compuserve.) A PNG file, on the other hand, was developed by an Internet committee expressly to be patent-free. It also provides a number of improvements over the GIF format.

Like a GIF, a PNG file is compressed in lossless fashion (meaning all image information is restored when the file is decompressed during viewing). A PNG file is not intended to replace the JPEG format, which is "lossy" but lets the user make a trade-off between compression and quality when the image is restored. Ideally, an image in a PNG file can be 10 to 30% more compressed than in a GIF format.

Public Domain software

Programs that are uncopyrighted because their authors intended to share them with everyone else are in the public domain. The UNIX community has developed a number of such programs over the years. Programs in the public domain can be used without restriction as components of other programs. When reusing such code, it is good to understand its history so that you can be sure it really is in the public domain.

Raster

Raster (or pixel based) programs describe shapes as a pattern of dots or pixels. With these programs you can edit scanned images or create your own images. Images on the web (.gif & .jpg) are this type of image. Each image is made up of tiny squares of color called pixels. Each pixel has only one color and it is made up of an RGB (Red, Green, Blue) value. Once all these colored pixels are side by side, they form an image. Some examples of Raster paint programs are Adobe Photoshop, Paint Shop Pro, Macromedia X-Res, Fractal Design Painter, and L-View.

RGB

RGB is an image file format in which each pixel is a combination of Red, Green, and Blue. This means that a color map is not required to reproduce the image.

Run Length

Run Length is a *lossless* compression method. Run Length produces the best compression for images that contain large areas of solid white or black. (Not good if there are too many changes in black & white, for example a checkerboard would actually create a larger file.) A good example of an image that would benefit from Run Length compression: Yin/Yang symbol.

Shareware

Shareware is software that is distributed free on a trial basis with the understanding that the user may need or want to pay for it later. Some software developers offer a shareware version of their program with a built-in expiration date (after 30 days, the user can no longer get access to the program). Other shareware (sometimes called liteware) is offered with certain capabilities disabled as an enticement to buy the complete version of the program.

You can find a great deal of shareware and freeware at http://www.shareware.com.

TIFF

Tagged Image File Format enables high-resolution bitmapped graphics to be displayed, edited and output by applications and most operating systems. The TIFF format is used for storing black and white, grayscale, or color bitmap images.

TIFF image data typically comes from scanners, frame grabbers, and paint- and photo-retouching programs. Its purpose is to describe and store raster images. The primary reason for TIFF is to provide a rich environment within which applications can exchange data. This richness is required to take advantage of varying capabilities of scanners and other imaging devices that are available. TIFF images are made up of four baseline types: bi-level, grayscale, palette-color, and RGB full-color images. It is not used for storing text or draw-type graphics. TIFF also allows for a unlimited amount of private or special-purpose information to be added to a fill.

TIFF is hardware and software independent. TIFF is not tied to any specific scanner, printer, or display hardware. It is also portable, since it does not favor particular operating systems, file systems, compilers, or processors (this is common of most widely used file formats).

TIFF provides several different compression schemes that allow you to trade-off size and quality to archive a file that is of best use to you. These compression schemes include JPEG, LZW, Huffman, and packbits compression. The compression schemes help to shorten file transfer time but the decoding of a TIFF file takes longer then other available file formats. TIFF files are best used for scanning images

URL

A URL (Uniform Resource Locator) is the address of a file (resource) accessible on the Internet.

Vector

Vector programs use mathematical calculations to draw the shapes. Layering these shapes gives the appearance of an image. These programs rely on a language (for example, Postscript) to describe how to draw a graphic. Vector programs are generally used for creating original artwork, logos or special text effects that you can't create with Raster (pixel based) programs. Once you create an image in a vector program, you usually import it into a Raster Paint program to add more color or depth to the image. With vector programs, you can't save as a .gif or .jpg image. They each have their own special format that saves your image in layers. Some examples of vector programs are Adobe Illustrator, Corel Draw, and Macromedia Freehand.

.WAV

The format for storing sound in files developed jointly by Microsoft and IBM. Support for WAV files was built into Windows 95 making it the de facto standard for sound on PCs. WAV sound files end with a .wav extension and can be played by nearly all Windows applications that support sound.

WMF

The PC-based counterpart to PICT. Windows Metafile Format is a standard default format used by PC clipboards if images are cut, copied, and pasted between applications.

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APPENDIX

C

URL SOURCE FILES

In addition to the many that are already found throughout the text.

3D Modeling

The ultimate 3D modeling and animation site of Pixar
http://www.pixar.com)

Audio

An eclectic sight of both comic and serious audio clips can be found at:
http://dailywav.com

Cool Stuff

One of the great sites of all time, existed before the WWW (in the days of
gopher!).
http://sunsite.unc.edu/

A terrific service by the folks at Lawrence Livermore Labs is a *WWW Viewer Test
Page*. On this page they have compiled all the data types with a test button. When
the test is selected, the Web server sends back data of the selected type. This is
extremely useful for checking the functionality of a Web browser and its operating
environment.
http://www-dsed.llnl.gov/documents/WWWtest.html

WWW Browser Test Document
http://wwwedu.ssc.nasa.gov/htmls/wwwbrow.htm

Graphics

Page on Silicon Graphics Web site that links to all SGI products regarding
multimedia.
http://www.sgi.com/software/software.html#media

Various links to sources for icons, jpegs, and other graphics.
http://www.stars.com/Vlib/Providers/Images_and_Icons.html

Silicon Graphics Web site with lots of interesting images!
http://www.sgi.com/Fun/free/gallery.html

Eastman Kodak Co.'s Web page includes links to a wide variety of photographic topics.

http://www.kodak.com/

Fractal Design Corp.'s site includes galleries of artwork (most created with Fractal Design products, of course) that you can view and use as a source of graphical ideas.

http://www.fractal.com/

Yahoo's extensive Photography master page includes roughly 20 photo-related categories, including galleries, exhibits, museums, photographers and stock photography companies. You'll find hundreds of links to interesting photos, clip art, utilities, and other exciting graphics on the Web.

http://yahoo.com/arts/photography/

With West Stock Inc.'s Muse service, you can view thumbnails of more than 5,000 offerings, select and download images, and pay for your purchases 24 hours a day, all without leaving the comfort of your browser.

http://www.weststock.com/

PhotoDisc Inc., a publisher of CD-ROM image collections, provides an online service tapping its library of more than 10,000 images.

http://www.photodisc.com

Cloud Gallery has 32 fine-art photos of clouds and other scenery that you can incorporate into your own pages.

http://www.commerce.digital.com/palo-alto/CloudGallery/home.html

You can preview stock photography portfolios that are updated monthly and include a broad range of subjects, including people, multimedia, and backgrounds, for several top shooters at

http://www.indexstock.com/pages/profile.htm

Liaison International Inc. posts 1,400 of the best of its 4 million images at

http://www.liaisonintl.com/

One Mile Up, Inc. is the creator, designer and manufacturer of the **Federal Clip Art Libraries**. Federal Clip Art is electronic artwork illustrated on a computer by expertly trained artists for use by desktop publishers competing in the federal arena. It has 14 collections of over 7,800 computer illustrations hand-drawn to government specifications. Topics range from military insignia and combat art to foreign and domestic maps, flags and coats of arms.

http://www.onemileup.com/

Maps

Map Art contains beautifully rendered and accurate World maps, globes and US State Terrain maps to integrate into your multimedia or print design.
http://www.map-art.com/

Navy

Multimedia Project Gallery contains links to some video clips and still photos of various experiments and projects, grouped by ship/project type.
http://www50.dt.navy.mil/gallery/

Science & Engineering

Frank Potter's Science Gems – Engineering related sites (over 200). Lots of fascinating information, geared towards educational/research topics.
http://www-sci.lib.uci.edu/SEP/engineer.html

Software

One of the best sites for downloading Shareware and Freeware programs. Gives programs ratings (from one to five cows).
http://www.tucows.com

Another source of software on the Web. Software is categorized by type and is available for download. Indicated on type of software: freeware, shareware or cost. Links to the home pages and to directly download the software are available.
http://www.download.com

Software Distribution, Macintosh Computers
http://ccsmacinfo.ccs.queensu.ca/MacSDistribution/Mac_soft.html

Space

Goddard Space Flight Center links to graphics, movies and satellite information.
http://pao.gsfc.nasa.gov/gsfc/gallery/index.html

Links to graphics, movies and low, medium and high resolution graphics of the Space Station.
http://station.nasa.gov/core.html
http://station.nasa.gov/gallery/index.html
http://207.86.88.39/news/photos/artistic.html

Digital Library at Ames Research Center. Includes samples in the Aeronautical, Life Sciences, Astrobiology, Earth Sciences and Space area.
http://ails.arc.nasa.gov/digital1.html

VRML

The VRML Repository is an impartial, comprehensive, community resource for the dissemination of information relating to VRML. Maintained by the San Diego Supercomputer Center (SDSC).

http://www.sdsc.edu/vrml

Web Development

"The Web Developer's Virtual Library" All around great educational site to teach yourself about the current and up-and-coming web development technologies. Not affiliated with any software manufacturer.

http://www.stars.com

MULTIMEDIA RESOURCES

This features table contains a list of companies that offer the multimedia products indicated by the chart. Visit them at the sites listed for more details and to see what other products and services are available.

Company	Web Site	Sound	Animation	Video	Background	Buttons
Allegro New Media	www.businessplus.com				✔	
Amug CD Inc.	www.amug.com	✔		✔		
Aridi Computer Graphics Inc.	www.aridi.com				✔	
Artbeats Software Inc.	www.artbeats.com		✔	✔	✔	✔
Aware Inc.	www.aware.com	✔				
Aztech New Media Corp.	www.aztech.com	✔			✔	
BeachWare	www.beachware.com	✔	✔	✔	✔	✔
Bright Ideas	www.dtp-ideas.com				✔	
Corel Corp.	www.corel.com	✔		✔		
D'Pix of Amber Productions	www.monotype.com				✔	
Davika Corp.	www.davka.com	✔				
Digital Stock Corp.	www.digitalstock.com				✔	
Educorp	www.educorp.com	✔		✔	✔	✔
The Hollywood Film Music Library	www.firstcom.com	✔				
Image Club Graphics	www.imageclub.com				✔	✔

Company	Web Site	Sound	Animation	Video	Background	Buttons
Image Farm Inc.	www.imagefarm.com				✓	
Imagetects	www.imagecels.com				✓	
IMSI	www.imsisoft.com	✓	✓	✓	✓	✓
Letraset	www.letraset.com		✓		✓	✓
Media In Motion	www.mmotion.com	✓	✓			
Mediacom Inc.	www.mediacominc.com			✓		
The Music Bakery	www.musicbakery.com	✓				
Olduvai Corp	www.olduvai.com	✓			✓	
Pacific HiTech Inc.	www.pht.com				✓	
PhotoDisc Inc.	www.photodisc.com	✓			✓	
PhotoSphere Images	www.photosphere.com				✓	
Rocky Mountain Digital Peeks	www.sni.net/malls/rmdp				✓	
RomTech	www.romtech.com	✓				✓
Seattle Support Group	www.ssgrp.com				✓	
Sense Interactive Corp.	www.mediaplace.com/sense				✓	
Showker Graphic Arts	www.graphic-design.com				✓	✓
T/Maker Co.	www.clickart.com				✓	
Totem Graphics Inc.	www.gototem.com				✓	✓

Company	Web Site	Sound	Animation	Video	Background	Buttons
TOTO Computer Graphics Inc	www.toto-cgi.com				✓	
VCE	www.vce.com		✓	✓		
Vivid Details	www.vividdetails.com				✓	
Xaos Tools Inc.	www.xaostools.com				✓	
Zedcor Inc.	www.arttoday.com				✓	

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APPENDIX

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ADOBE PRODUCT PRICE LIST

On GSA schedule GS-35F-4139D

INFODATA SYSTEMS INC.
703-218-1155

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	16010011	Adobe Dimensions v3.0 for Mac/PowerMac	$108.70	30 days	yes	U.S.
Infodata	132-33	Adobe	26010011	Adobe Dimensions v3.0 for Win 95/NT 4.0 or later	$108.70	30 days	yes	U.S.
Infodata	132-33	Adobe	16000146	Adobe Illustrator v7.0 for Mac/PowerMac	$324.99	30 days	yes	U.S.
Infodata	132-33	Adobe	26000008	Adobe Illustrator v7.0 for Win 95/NT 4.0 or later	$324.99	30 days	yes	U.S.
Infodata	132-33	Adobe	16000152	Adobe Illustrator v7.0 5 Pack for Mac/PowerMac	$1,299.98	30 days	yes	U.S.
Infodata	132-33	Adobe	02600013	Adobe Illustrator v7.0 5 Pack for Win 95/NT 4.0 or later	$1,299.98	30 days	yes	U.S.
Infodata	132-33	Adobe	13110001	Adobe ImageReady v1.0 for PowerMac	$163.32	30 days	yes	U.S.
Infodata	132-33	Adobe	23110001	Adobe ImageReady v1.0 for Win 95/NT	$163.32	30 days	yes	U.S.
Infodata	132-33	Adobe	16020011	Adobe Streamline v4.0 for Mac/PowerMac	$108.70	30 days	yes	U.S.
Infodata	132-33	Adobe	26020011	Adobe Streamline v4.0 for Win 95/NT	$108.70	30 days	yes	U.S.
Infodata	132-33	Adobe	07501030	Adobe Illustrator 5.5 Single User Pack for SUN	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	07501035	Adobe Illustrator v5.5 5 User Pack for SUN	$2,182.10	30 days	yes	U.S.

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	07501036	Adobe Illustrator v5.5 10 User Pack for SUN	$3,820.72	30 days	yes	U.S.
Infodata	132-33	Adobe	07501042	Adobe Illustrator v5.5 Documentation Only for SUN	$81.93	30 days	yes	U.S.
Infodata	132-33	Adobe	07101036	Adobe Photoshop v3.0.1 Single User Pack - Node Locked for SUN	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	07101029	Adobe Photoshop v3.0.1 Single User Pack - Floating for SUN	$1,035.06	30 days	yes	U.S.
Infodata	132-33	Adobe	07101026	Adobe Photoshop v3.0.15 User Pack for SUN	$4,148.45	30 days	yes	U.S.
Infodata	132-33	Adobe	07101031	Adobe Photoshop v3.0.1 Documentation Only for SUN	$81.93	30 days	yes	U.S.
Infodata	132-33	Adobe	06501023	Adobe Illustrator v5.5 Single User Pack for SGI	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	06501024	Adobe Illustrator v5.5 5 User Pack for SGI	$2,182.10	30 days	yes	U.S.
Infodata	132-33	Adobe	06501012	Adobe Illustrator v5.5 10 User Pack for SGI	$3,820.72	30 days	yes	U.S.
Infodata	132-33	Adobe	06501025	Adobe Illustrator v5.5 Documentation Only for SGI	$81.93	30 days	yes	U.S.
Infodata	132-33	Adobe	06101033	Adobe Photoshop v3.0.1 Single User Pack - Node Locked for SGI	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	06101026	Adobe Photoshop v3.0.1 Single User Pack - Floating for SGI	$1,035.06	30 days	yes	U.S.
Infodata	132-33	Adobe	06101023	Adobe Photoshop v3.0.1 5 User Pack for SGI	$4,148.45	30 days	yes	U.S.
Infodata	132-33	Adobe	06101028	Adobe Photoshop v3.0.1 Documentation Only for SGI	$81.93	30 days	yes	U.S.
Infodata	132-33	Adobe	27500001	Adobe PageMaker v6.0 for Win 3.1/95	$488.86	30 days	yes	U.S.

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	17500186	Adobe PageMaker v6.52 for Mac/PowerMac	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	27500155	Adobe PageMaker v6.52 for Win 95/NT	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	17500191	Adobe PageMaker v6.52 License Pack for Mac/PowerMac	$391.08	30 days	yes	U.S.
Infodata	132-33	Adobe	27500160	Adobe PageMaker v6.52 License Pack for Win 95/NT	$391.08	30 days	yes	U.S.
Infodata	132-33	Adobe	17500189	Adobe PageMaker v6.52 5 User License Pack for Mac/PowerMac	$1,955.42	30 days	yes	U.S.
Infodata	132-33	Adobe	27500158	Adobe PageMaker v6.52 5 User License Pack for Win 95/NT	$1,955.42	30 days	yes	U.S.
Infodata	132-33	Adobe	01750590	Adobe PageMaker v6.52 FC for Mac/PowerMac	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	02750421	Adobe PageMaker v6.52 FC for Win 95/NT	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	27910016	Adobe FrameMaker v5.1.1 for Windows 3.1	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	27910004	Adobe FrameMaker v5.1.1 for Win 95/NT 3.5 or later	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	17910059	Adobe FrameMaker v5.5 for Mac/PowerMac	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	27910081	Adobe FrameMaker v5.5 for Win 95/NT	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	37900224	Adobe FrameMaker v5.5 Personal for UNIX - SUN, IBM, SGI & HP	$816.58	30 days	yes	U.S.
Infodata	132-33	Adobe	37900226	Adobe FrameMaker v5.5 Shared for UNIX - SUN, IBM, SGI & HP	$1,417.41	30 days	yes	U.S.
Infodata	132-33	Adobe	2790424	Adobe FrameViewer v5.1.1 for Windows 3.1	$15.84	30 days	yes	U.S.

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	17930001	Adobe FrameViewer v5.5 for Mac/PowerMac	$15.84	30 days	yes	U.S.
Infodata	132-33	Adobe	27930001	Adobe FrameViewer v5.5 for Win 95/NT	$15.84	30 days	yes	U.S.
Infodata	132-33	Adobe	37930001	Adobe FrameViewer v5.5 for UNIX - SUN, IBM, SGI & HP	$27.31	30 days	yes	U.S.
Infodata	132-33	Adobe	47930004	Adobe FrameViewer Retrieval Toolkitv5.5 for Mac/Win/UNIX	$2,182.10	30 days	yes	U.S.
Infodata	132-33	Adobe	02790001	Adobe FrameMaker v5.1.1+SGML for Windows 3.1 or later	$816.58	30 days	yes	U.S.
Infodata	132-33	Adobe	08790001	Adobe FrameMaker v5.1.1+SGML Personal for UNIX - SUN, IBM, SGI & HP	$1,089.68	30 days	yes	U.S.
Infodata	132-33	Adobe	8790004	Adobe FrameMaker v5.1.1+SGML Shared for UNIX - SUN, IBM, SGI & HP	$2,182.10	30 days	yes	U.S.
Infodata	132-33	Adobe	17920004	Adobe FrameMaker v5.5+SGML for Mac/PowerMac	$1,089.68	30 days	yes	U.S.
Infodata	132-33	Adobe	27920004	Adobe FrameMaker v5.5+SGML for Win 95/NT	$1,089.68	30 days	yes	U.S.
Infodata	132-33	Adobe	37920003	Adobe FrameMaker v5.5+SGML Personal for UNIX - SUN, IBM, SGI & HP	$1,089.68	30 days	yes	U.S.
Infodata	132-33	Adobe	37920007	Adobe FrameMaker v5.5+SGML Shared for UNIX - SUN, IBM, SGI & HP	$2,182.10	30 days	yes	U.S.
Infodata	132-33	Adobe	17920007	Adobe FrameMaker v5.5+SGML Migration for Mac/PowerMac	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	27920007	Adobe FrameMaker v5.5+SGML Migration for Win 95/NT	$543.48	30 days	yes	U.S.

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	27920006	Adobe FrameMaker v5.5+SGML Migration Personal for UNIX - SUN, IBM, SGI & HP	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	37920010	Adobe FrameMaker v5.5+SGML Migration Shared for UNIX - SUN, IBM, SGI & HP	$816.58	30 days	yes	U.S.
Infodata	132-33	Adobe	25510001	Adobe After Effects v3.1 for Win 95/NT	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	15510002	Adobe After Effects v3.1 Production Bundle for Mac/PowerMac	$1,089.68	30 days	yes	U.S.
Infodata	132-33	Adobe	25510005	Adobe After Effects v3.1 Production Bundle for Win 95/NT	$1,089.68	30 days	yes	U.S.
Infodata	132-33	Adobe	15510062	Adobe After Effects v3.1 PB/Photoshop v4.0 for Mac/PowerMac	$1,362.79	30 days	yes	U.S.
Infodata	132-33	Adobe	25510024	Adobe After Effects v3.1 PB/Photoshop v4.0 for Win 95/NT	$1,362.79	30 days	yes	U.S.
Infodata	132-33	Adobe	15510094	Adobe After Effects v3.1 PB/Premiere v4.2 for Mac/PowerMac	$1,362.79	30 days	yes	U.S.
Infodata	132-33	Adobe	25510061	Adobe After Effects v3.1 PB/Premiere v4.2 for Win 95/NT	$1,362.79	30 days	yes	U.S.
Infodata	132-33	Adobe	15500014	Adobe Premiere v5.0 for PowerMac	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	35500001	Adobe Premiere v4.2 for SGI	$543.48	30 days	yes	U.S.
Infodata	132-33	Adobe	22101133	Adobe Acrobat Capture v2.0.1 for Win 95/NT	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	25500014	Adobe Premiere v5.0 for Win 95/NT 4.0 or later	$488.86	30 days	yes	U.S.
Infodata	132-33	Adobe	22101104	Adobe Acrobat Capture 20,000 Pack for Win 95/NT	$324.99	30 days	yes	U.S.

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	22101103	Adobe Acrobat Capture 200,000 Pack for Win 95/NT	$2,728.31	30 days	yes	U.S.
Infodata	132-33	Adobe	12001136	Adobe Acrobat v3.0.1 for Mac/PowerMac	$161.13	30 days	yes	U.S.
Infodata	132-33	Adobe	22001137	Adobe Acrobat v3.0.1 for Win 3.1/Win 95/NT	$161.13	30 days	yes	U.S.
Infodata	132-33	Adobe	42001144	Adobe Acrobat v3.0.1 Cross Platform 10 PK for Mac/PowerMac/Win 3.1/ Win 95/NT	$871.20	30 days	yes	U.S.
Infodata	132-33	Adobe	17700075	Adobe Pagemill v2.0.1 for Mac/PowerMac	$81.38	30 days	yes	U.S.
Infodata	132-33	Adobe	27700095	Adobe Pagemill v3.0 for Win 95/NT 4.0	$81.38	30 days	yes	U.S.
Infodata	132-33	Adobe	32001139	Adobe Acrobat v3.0.1 for UNIX - SUN/HP/AIX	$128.91	30 days	yes	U.S.
Infodata	132-33	Adobe	32001147	Adobe Acrobat v3.0.1 UNIX 10 Pack - SUN/HP/AIX	$696.96	30 days	yes	U.S.
Infodata	132-33	Adobe	17170000	Adobe Type Basics v4.0 for Macintosh	$108.15	30 days	yes	U.S.
Infodata	132-33	Adobe	27170000	Adobe Type Basics v4.0 for Windows	$108.15	30 days	yes	U.S.
Infodata	132-33	Adobe	01333164	Adobe Type Manager Deluxe v4.0 for Mac/PowerMac	$54.59	30 days	yes	U.S.
Infodata	132-33	Adobe	02332019	Adobe Type Manager Deluxe v4.0 for Windows 95 only	$54.59	30 days	yes	U.S.
Infodata	132-33	Adobe	02332032	Adobe Type Manager Deluxe v4.0 for Windows NT only	$54.59	30 days	yes	U.S.
Infodata	132-33	Adobe	0133179	Adobe Type Manager Deluxe 4.0 and Adobe Type Reunion Deluxe v2.0	$65.54	30 days	yes	U.S.

Dealer Name	SIN	MFR Name	MFR Part No	Product Description	GSA Price	Warr	Year 2000	Prod Point
Infodata	132-33	Adobe	47040000	Adobe Type On Call v4.2 (Font Families 1-380) for Mac/PowerMac	$37.69	30 days	yes	U.S.
Infodata	132-33	Adobe	01871013	Adobe Type Reunion Deluxe v2.0 for Mac/PowerMac	$32.77	30 days	yes	U.S.
Infodata	132-33	Adobe	47060000	Adobe Font Folio v8.0 2 Printer/20 CPU License	$4,478.91	30 days	yes	U.S.
Infodata	132-33	Adobe	18101020	Adobe PhotoDeluxe v2.0 for Macintosh	$26.76	30 days	yes	U.S.
Infodata	132-33	Adobe	28101021	Adobe PhotoDeluxe v2.0 for Win 3.1/Win 95/NT	$26.76	30 days	yes	U.S.
Infodata	132-33	Adobe	01481012	Adobe Home Publisher Dlx CD 2.1for Macintosh	$40.96	30 days	yes	U.S.
Infodata	132-33	Adobe	28110001	Adobe PhotoDeluxe Business Edition v1.0	$54.07	30 days	yes	U.S.
Infodata	132-33	Adobe	670-001	Adobe Type Twister v1.0 for Macintosh	$27.30	30 days	yes	U.S.
Infodata	132-33	Adobe	680-001	Adobe Type Twister v1.0 for Windows	$27.30	30 days	yes	U.S.
Infodata	132-33	Adobe	15500035	Adobe Premiere v5.0 for PowerMac	$108.70	30 days	yes	U.S.
Infodata	132-33	Adobe	25500035	Adobe Premiere v5.0 for Win 95/NT 4.0 or later	$108.70	30 days	yes	U.S.

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